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Vol. 7, No. 1, March, 1960 *Eugenics Quarterly*

RESOURCES OF MENTAL ABILITY
How Can the Supply of Superior Ability Be Conserved and Perhaps Increased?

LEE R. DICE
Professor Emeritus of Zoology
University of Michigan
and Research Associate
Cranbrook Institute of Science

AS MODERN CIVILIZATION GROWS in complexity the demand for mental ability is increasing in something like a geometrical progression. Needed are able and inspiring teachers, imaginative engineers and architects, resourceful investigators, broad-minded administrators, competent physicians and lawyers, and a host of other types of professional workers. In the past 50 years, for example, the number of scientists in the United States has increased ten times as rapidly as the whole population (Wolfle, 1954), but the demand still exceeds the supply.

Craftsmen, technologists, and many other types of workers with above-average ability also are required in increasing numbers. To build and to maintain the complicated machines of modern industry requires a high degree of competence. Business also is demanding increasingly higher levels of ability. The farm manager now requires a long process of education and experience added to a large degree of natural talent. The successful housewife and mother, furthermore, must have many special abilities. Men with muscular power and physical endurance are still needed for many operations, but machines are taking over an increasing proportion of their duties.

The maintenance and further evolution of the complicated human communities that now dominate the earth requires not only that all our resources of mental ability be fully utilized and conserved but also that these resources be, if possible, further expanded.

Facilities are consequently required in every society for discovering which of its young men and young women possess potential mental ability of any type. Means must then be found for encouraging each of these young people to prepare for the field of activity best suited to his talents and interests. Each should

be educated and trained so that the best possible use is made of his capabilities. The full exploitation of potential ability of every useful kind will benefit not only the individuals concerned, but will promote also the welfare of the whole commonwealth.

SUPPLY OF TALENT IS LIMITED

Even if every capable student is identified and given the best possible education and training, however, this will at best permit only the full utilization of those talents that already exist in the population. The supply of potentially able young men and women in the present world population, unfortunately, is limited. Even if all promising young people can be located and trained, their number will certainly be less than can profitably be used by the increasingly complex civilizations which are in process of evolution.

Students with high mental capacities are rare, as every teacher knows. A good education added to strong incentive has enabled many a below-average student to become a useful worker. More than education and incentive are needed, however, to produce an individual who ranks high in any special field of effort.

Some of the qualities that may enable a person to be outstanding in one type of work may contribute to his possible success in a different field of effort. The mathematician, physician, engineer, research scientist, artist, and musician, however, must each have talents of a special kind (Dorn, 1947), as well as training in his own particular field. The demand for specialists of many diverse kinds can be expected to increase for many years in the future.

Success in any kind of career undoubtedly is based on a complex of factors. These factors include not only the various elements of intelligence and training but also involve attributes of personality, such as may be called imagination, perseverance, dependability, curiosity, and social cooperativeness (Cattell, 1957: Table A-3). The state of physical health also may sometimes affect the expression of the mental qualities. At the present time, unfortunately, the numerous elements of intelligence, personality, education, and physical well-being that together may create a predisposition for any special type of ability cannot be successfully measured or classified.

IMPORTANCE OF HEREDITY

Heredity is known, however, to be an important factor in the production of many features of superior intelligence. Some important factors of personality also have a strong hereditary component (Cattell, 1950). By comparing sets of identical twins with sets of non-identical but same-sexed twins, for example, it has been demonstrated that many of the measurable psychological characters that might contribute to mental ability are dependent to a considerable degree on heredity (Vandenberg, 1956; and unpublished data). Those persons who have a special talent of any kind may fail to use it effectively unless they are given sufficient encouragement and unless they receive a suitable education. No amount of encouragement or education, however, can transform a stupid student into one who is intellectually superior.

The precise mode of heredity of the several factors that in proper combination may provide the potentiality for any human special ability, or for excellence in overall ability, is not known with certainty. The available evidence,

however, strongly suggests that the several factors which underlie intelligence, personality, and physical health and are basic to the expression of superior ability are each inherited through the combined action of numerous genes (Fuller, 1954; Neel and Schull, 1954). This is the multiple-factor or polygene type of heredity.

A special feature of multifactorial heredity is that the genes concerned are additive in their effects. A character that is controlled by genes of this type will in general be only slightly affected by the presence or absence of any one gene. The identification of the precise genes that may influence mental superiority, consequently, is not essential as a basis for considering the level of hereditary talent in any given population. Those individuals who exhibit superiority in any character can be assumed to be the carriers of more than an average number of those genes which may contribute to the production of that character.

Those multiple genes that control the heredity of mental capacities must be widely distributed in every human population. Due to the recombination of these genes in each generation, considerable variation is to be expected among the children in each family, but there also will be certain family resemblances. The children of a person with a certain outstanding ability may not equal their parent in this character. The expectation, nevertheless, is that from parents who both exhibit a talent of any particular kind, the children will for that talent average above the general level of the population of which they form a part.

Long before there was any precise knowledge of genetic laws, the plant and animal breeders had demonstrated how to improve traits that are controlled by multiple genes. By selecting as parents those individuals who exhibited in highest degree the particular trait desired, such wonders have been developed as high milk productivity by cows, high egg productivity by hens, and swift running by race horses. Breeds of dogs have been developed which have the capacity to be trained for various special types of behavior.

No such rigorous selection could be applied to a human population, nor would we wish it to be. The selection which would result from a wholly voluntary increase in family size by those persons who possess a particular character, such as a special mental ability, however, would be expected to produce in just a few generations an appreciable improvement in the character selected for. We are not here concerned with developing a new kind of human race but only with raising the general level of ability.

The increase of potential mental ability in human populations actually is basically not a genetic problem at all. Although it is desirable to learn as much as possible about the mode of inheritance of all kinds of human traits, including special mental abilities, it is not necessary to know the precise mode of heredity of a trait controlled by multiple genes in order to plan for the increase of that trait in a population. The knowledge we really need is how the several social factors operate among persons with differing mental capacities to determine their mate selection, age at marriage, and size of family.

DIFFERENTIAL FERTILITY IN RESPECT TO ABILITY

For as far back as we have any records, there appear to have been differences

in fertility between the several economic, educational, occupational, and social classes and between rural and urban groups, in almost every case the higher birth rates being found in the lower class and in the rural groups (Osborn, 1951; Kiser, 1952; Grabill and others, 1958; Westoff, 1954). These differences increased with the introduction of birth control and have declined somewhat as contraception has come into wider use. At the present time these differentials appear to be directly related to the extent of the use of contraceptives.

Standing alone, these differentials would appear to make for a decrease in each generation of those genetic factors favorable to high intelligence, character, and drive. But there may be offsetting factors of which at present we have no knowledge. Indeed we do not know the extent to which the social classes differ in genetic capacities, nor whether differences in size of family within social groups may offset differences between groups.

In general, scientific opinion today favors the more pessimistic interpretation. But these differences are due to social causes, and we believe that acceptable and relatively slight changes in social, psychological, and economic conditions could result in differentials of a favorable sort. Some of these possible changes will be suggested in a later section of this paper.

OTHER MECHANISMS THAT MAY AFFECT ABILITY

In addition to differential reproduction the most important of the mechanisms which may conceivably affect changes in mental capacity from one generation to another are assortative mating, sexual selection, natural selection, heterosis, and mutation.

Positive assortative mating, the tendency for like to mate with like, should result in the production of some families with above-average mental ability. On the other hand, some families with below-average ability also will be produced. Assortative mating offers the possibility of producing some individuals with exceptionally high mental capacity, but this is balanced by the equal probability of producing some individuals with exceptionally low capacity. Assortative mating by itself, consequently, will neither raise nor lower the average intellectual level of a population, but it may be an important mechanism in the evolution of special abilities.

Sexual selection (preferential mating) may be presumed to have been important in early human societies in promoting the evolution of certain special abilities (Holmes, 1936; Dice, 1955). In a hunting tribe, for instance, ability in hunting may give a man a preferred rating as a marriage partner (Holmberg, 1950). In many preliterate societies not only did those persons who exhibited preferred types of abilities have priority in the marriage market, but the most able men often had more than one wife. In such societies sexual selection must often have resulted in differential reproduction which favored the particular abilities which were locally esteemed.

Reliable information about the operation of sexual selection for or against mental abilities, unfortunately, is almost completely lacking in modern societies. In the United States, however, sexual selection seems in general not to favor intellectual capacity. On the contrary, overemphasis on female physical beauty probably results in some degree of selection against intellectual capacity, at least in women. This is indicated by the fact that 15 per cent or more of

women college graduates never marry (Population Reference Bureau, 1956). In this country there also is overemphasis on athletic ability and on economic success in men. In intellectual circles, intelligence is probably of some advantage, both to men and to women, in securing a desirable mate. It may be doubted, however, if this is true for most classes in the population. In the United States, therefore, sexual selection may be contributing to adverse differential reproduction in respect to mental capacity.

Natural selection (differential mortality) is another agency that may affect the frequency in the population of those genes that contribute to mental superiority of any kind. Any hereditary factor that results in involuntary sterility or in death before the end of the reproductive period may be considered to be subject to natural selection. In spite of statements sometimes made that natural selection is ineffective in modern populations, it is still a powerful force (Holmes, 1936; Dobzhansky and Allen, 1956; Neel, 1958). It operates especially to remove those hereditary defects which cause death before or soon after birth or which result in infertility. Idiots and imbeciles generally have no offspring, and consequently a portion of the genes that produce these severe mental defects will be eliminated from each generation. One type of low-grade mental defect associated with phenylketonuria is produced by a recessive gene. Several other types of mental defects likewise are inherited through simple genetic mechanisms (Kallmann, 1953). Mutations that produce mental defects such as these may be presumed to occur at a low but persistent rate. If these genes were not removed by natural selection, they would accumulate to form a heavy load of unfortunate heredity. On the other hand, there is no evidence that in modern populations natural selection in any way affects the frequency of those multiple genes that control superior mental capacity.

Differential mortality produced by cultural rather than by biological factors might also affect the supply of inherited ability. In some populations mortality may be at a higher rate for children who are low in intelligence than for those who have greater inborn intellect (Holmes, 1933). Such differential mortality might result from inadequate care of their children by parents who are themselves of relatively low intelligence. The families of incompetent parents, moreover, will likely be reared under conditions of poverty which predispose to malnutrition and disease. The economic condition and health of all classes in the United States, fortunately, are steadily being improved. The current amount of differential mortality in the United States due to inadequate child care or other cultural features is unknown, but may be presumed to be small.

That heterosis (hybrid vigor) may cause differential fertility in respect to intelligence has been suggested by Penrose (1955). According to this hypothesis, those genes that control intelligence are assumed also to affect fertility. It is postulated that when these genes are in homozygous combinations they may produce either low intelligence combined with low fertility or high intelligence, also combined with low fertility. When, on the contrary, these genes are in heterozygous combinations, they are assumed to produce not only an intermediate level of intelligence, but also, through hybrid vigor, an increase in fertility.

There is no good evidence, however,

that those genes which in the homozygous combination produce both mental defects and infertility, occur at the same loci as any of those multiple genes that may contribute to mental superiority. In modern populations, furthermore, family size is mostly controlled by economic and social factors, rather than by inability to produce children. In the early years of the United States family size averaged much greater than now. This was true of families in which the parents presumably had high intelligence as well as of those whose parents were less well endowed. This indicates that high intelligence is not directly related to biological infertility. Heterosis among the genes responsible for intelligence consequently seems not to be an important factor in producing differential fertility among the classes in our society.

Mutation undoubtedly occurs in those genes that control mental ability. Little information is available about the mutation rates of those multiple genes that underlie superior talent, but each of these can be expected to mutate at approximately the same slow rate as other human genes. Further, it can be expected that most such mutations will result in a decrease, rather than in an increase of potential ability. Even those mutations that may produce some improvement in mental capacity will not spread in a large population except as a result of favorable selection. Mutation, consequently, may be expected in general to produce deterioration rather than improvement.

That the intelligence requirements for marriage are currently being pushed upwards in modern societies has been suggested by Neel (1958). If this is occurring and if it is not accompanied by an increase of children born out of wedlock, it might offset to some degree any adverse effects of differential fertility. Evidence in support of this hypothesis, however, seems not to be available.

Differential mortality due to war undoubtedly affects to some degree the frequency of those genes that underlie ability (Hunt, 1930). So also does the celibacy which is obligatory in certain religious orders (Holmes, 1921: 361). Both these agencies, however, are believed to decrease, rather than to increase the supply of inherited ability.

The number of generations per century differs according to amount of schooling. Those persons who prepare themselves for intellectual careers by attending college, and especially those who go on to graduate school or professional school, marry on the average later in life and begin their families at an older age than those who do not have to spend so much time in special training (Wrong, 1958). This differential among the educational classes in the number of generations produced per century must be added to the other factors making for a decline in intelligence.

DECREASE IN GENES FOR SUPERIOR ABILITY

None of the genetic mechanisms or other agencies known to be operating in human societies, consequently, seem to be of a sort likely to increase the frequency of the genes underlying mental ability. It seems likely that in the United States at least some decrease in each generation must be taking place in the frequencies of those genes that produce superior mental capacity.

The seriousness of the decline per generation and per century of potential mental ability, however, is in much dispute. Some authors, taking into account not only genetic factors but also the effect on development of different home

environments have estimated that present rates of differential fertility would, if no other factors were involved, make for a decline at the rate of from 0.9 to as much as 4.0 or more I.Q. points per generation, when both hereditary and environmental factors are taken into account. Reliable methods for measuring this loss of intelligence, unfortunately, do not now exist (Dorn, 1947). Consequently, it is impossible to estimate the effects of current trends on the future supply of children who will have the capacity to become skilled workers or to profit by advanced training. The trend, however, is probably in the wrong direction. The world of the future will need a greater rather than a lesser percentage of persons who possess superior ability.

REQUIREMENTS FOR AN INCREASE IN HEREDITARY TALENT

Increase in the supply of hereditary mental capacity in any population evidently requires that those persons who possess an above-average level of ability must have more children than those persons who are below average. The reservoir of hereditary talent in any community resides in all those individuals who rank above average in any type of ability. Included in this category are technicians, craftsmen, businessmen, farm and factory managers and supervisors, professional workers, and numerous other types of workers who exhibit special competence in some particular line of endeavor. Women who rate above average in home making and child rearing must also be included. If the resources of mental ability of the country are to be increased, the fertility of these persons must exceed that of the less competent members of society.

Fear of overpopulation in the nation or world should not deter talented persons from rearing as many children as they can afford. Should overpopulation come in time to any country, the more able persons should have the best chance for survival. On the other hand, should the more talented members of any society continue for long to be less fertile than the less able members, then the average level of mental capacity of that society must inevitably decline.

A high diversity of those genes that underlie the production of superior mental abilities of various types undoubtedly is carried by every human population. In other words, every population carries a large supply of genetic material on which selection in the form of differential fertility can act. The genes for ability, however, are not distributed evenly throughout each population but are most concentrated in those individuals who exhibit any type of superior ability. The greater the endowment of talent enjoyed by any person, therefore, the more important it is that he or she should have a greater number of children than the average for the population.

HEREDITY COUNSELING CENTERS

Some talented persons remain childless because of the fear of transmitting to their children certain physical or mental defects which are known to occur in their ancestors or relatives. Every person, however, even though presumably "normal," carries in his heredity a number of more or less serious defects (Muller, 1950). Should it be certainly known that there is a high probability of transmitting a serious defect of any kind, then of course no considerate person will take the risk of afflicting a child. In every case, however, the probability of transmitting a defect should be bal-

anced against the probabilities for the transmission of superior characters, both mental and physical.

The heredity counseling centers which are being organized in many parts of the nation (Hammons, 1959) can aid prospective parents in assessing the probabilities for transmitting their good as well as their bad heredity. More of these centers are needed so that advice about their heredity will be available to all our citizens. Each such counseling center, moreover, should possess facilities for evaluating intelligence and personality as well as for the diagnosis of medical defects.

INCREASE IN THE FERTILITY OF INTELLECTUAL WORKERS

The current lesser fertility of intellectual workers than of other occupational classes undoubtedly is in part due to the longer period during their early life that such workers must spend in education and training. When they are financially able to begin their families, they are consequently older than other types of workers.

For most kinds of professional work graduate training, in addition to a college degree, is a necessary prerequisite. The master's degree, which is recommended for high-school teaching and for a number of other intellectual occupations, requires at the present time an average of about one and one-half years of graduate study. The Ph.D., or equivalent degree, which usually is required for university teaching or for research, requires an average of about four years in graduate school. Professional training in such subjects as medicine or law may require from two to as many as eight or more years after the bachelor's degree.

The period of graduate study is an expensive one, no matter what the field of specialization. Not only is there tuition and living expenses to pay but also books to buy and frequently travel or other special expenses. All this expense comes at the age when most other young people are getting married and starting their families. Unless the graduate student defers marriage, however, his wife probably will have to work to help support the pair. To care properly for children then is difficult or impossible. The young scientist who marries must consequently usually defer having children until he has completed his training and has secured a more or less permanent position. The salary of a young scientist after graduation, moreover, usually is low. The paying off of debts incurred during the training years may impose additional burdens upon the young family. Parents who are wealthy can aid their children during these difficult years, but not all the parents of gifted children are financially able to supply such aid. The proportion of graduate students who are married has increased in recent years, but it still is difficult to combine post-graduate study with marriage and the rearing of a family.

In order to ease to some degree the financial burden of graduate study, I recommend that every competent graduate student who has been accepted as a candidate for the master's or Ph.D. or equivalent degree by any reputable institution be provided with a tuition scholarship. These scholarships should not be competitive. Instead, a sufficient number should be available so that one can be granted to each qualified student. The qualifications should of course be sufficiently high to select only those students who truly have superior talents.

The number of teaching and research assistantships available to graduate stu-

dents also should be increased, so that all competent students can be provided for. Such assistantships not only help in recruiting able students for intellectual careers but incidentally provide teaching and research aid to the presently overburdened universities. A student learns much from serving as an assistant. An additional advantage of the assistantship is that the student works for the financial help he receives and is not given something for nothing.

Graduate students in the social sciences and humanities should in my opinion be eligible for scholarships and graduate assistantships on the same basis as students in the natural sciences, and graduate students who are candidates for degrees in medicine, dentistry, law, and other professions should also be considered. Ability of every kind is needed by our society.

A dependency allowance for a wife and for each child should be provided in each graduate assistantship. Such allowances now are provided in many fellowships. The extension to include assistantships is highly desirable, because of the added inducement this would give talented young married persons to prepare for intellectual careers.

These proposed graduate scholarships and assistantships should, in my opinion, be provided through the Department of Health, Education, and Welfare or through some other federal agency. Graduate students regularly cross state lines to attend those universities which provide the best instruction in their chosen field of specialization. Intellectual achievements, furthermore, are the property of the whole nation and world. The support of advanced training is consequently a national rather than merely a local or state obligation.

A program for loan funds for prospective teachers and college and graduate students has recently been organized by the federal government. Sufficient funds for this purpose should be made available so that every qualified student can obtain such assistance.

The availability to graduate students of tuition scholarships, assistantships, dependency allowances, and loan funds, as recommended above, can be expected to encourage graduate students to marry and to begin their families at a younger age than the present average. With such financial help these talented individuals will probably have larger families than otherwise they might have had. This is highly desirable, because the children of such intellectually superior parents have a better than average chance of being also talented. Osborn (1956) and others have urged that early marriage be made economically possible for gifted young people. Intellectual workers, however, comprise only a relatively small proportion of the population. Although an increase in their fertility will be valuable, no improvement in their fertility which can reasonably be anticipated will suffice alone to provide the desired amount of increase in the supply of talent.

ECONOMIC STATUS AND FERTILITY

Within certain social and occupational groups, fertility is known to be positively related to income level, at least in countries where birth control is widely practiced. We may also note that birth rates in the United States average higher during years of prosperity than during years of adverse economic conditions (Population Reference Bureau, 1958). Further study should reveal ways in which economic forces could be harnessed to bring about desirable changes in fertility differentials.

Natural fertility decreases with age. Especial care, therefore, should be taken to make it economically possible for those workers who are above average in ability to start their families early in life. The current difference in salary between the beginning professional worker and the older, well-established worker in the same field is probably too great.

PROGRAMS OF NEGATIVE EUGENICS

Certain past proposals have been designed to increase the level of intelligence in the population through limiting the reproduction of the least intelligent members of society.

One such program of negative eugenics has been directed toward the sterilization of persons who are mentally deficient. This program has been only slightly successful. Some persons have objected to sterilization on religious grounds. Others have objected to the compulsory aspects of the program. In some states there has been confusion between sterilization and punishment. A total of 60,926 individuals are reported by the Human Betterment Association of America to have been sterilized in the United States over the 52-year period from 1907 through 1958. Of this total, 31,500 were sterilized because of mental deficiency. In 1958 the number sterilized was 747. Compared to the size of the national population, these figures are relatively small. The number of unfavorable genes eliminated so far as a result of this program of sterilization must be too few to have produced any important increase in the level of intelligence of the nation as a whole (Neel and Schull, 1954: 344-346).

The segregation in mental institutions of persons with severe mental disorders, including mental deficiencies, undoubtedly operates to decrease the frequency in following generations of the genes that adversely affect mental competence. The shortage of hospital space to care for persons with subnormal mentality, however, limits the number who can be confined. No estimates seem to have been made of the actual genetic effects of the current amount of segregation of such persons.

The elimination of as many as possible of those genes that contribute to the production either of physical defects or of mental disorders certainly is highly desirable. The production of children by persons who carry hereditary defects of any serious kind or who are mentally, temperamentally, or financially not qualified to rear children properly, therefore, should be discouraged. Those individuals who for sufficient genetic or social reasons voluntarily request to be sterilized should be given this permission. The probate court or some other local authority should have the power to authorize the surgeon to perform the necessary operation. The parents or legal guardians of mentally incompetent individuals should be permitted to petition for the sterilization of their wards.

Relatively few individuals in any generation, however, are likely to be sterilized under any program suitable to a democracy. No considerable increase from such a program can be expected, consequently, in the frequency of those multiple genes that are believed to produce superior intellectual capacity.

BIRTH CONTROL

Birth-control methods have in recent years become of increasing importance for the voluntary limitation of family size. Unfortunately, birth control seems to have been more effective in limiting the number of children per family in the

professional and skilled-labor classes than in the unskilled-labor class. Those individuals who have ambition to raise their own economic and social position and those desirous of giving their children the best possible education and other advantages have presumably restricted the number of their children to a greater degree than those individuals who have less ambition for themselves or for their children. The result has been that in past years birth control probably has increased the fertility differentials among the economic classes in the United States. With the spread of contraceptive methods throughout the whole society, some decrease may be expected in the fertility of the lower occupational and educational classes. It may be doubted, however, that birth control will ever by itself operate to reverse the adverse differentials in fertility in respect to mental ability among these classes.

Birth-control methods, nevertheless, provide opportunity for parents to adjust the size of their families to their own particular economic and social conditions and also to their own hereditary endowments. Those legal and religious barriers that now obstruct the dissemination and use of birth-control methods should consequently be removed.

INADEQUACY OF PRESENT KNOWLEDGE

The organization of any effective program designed to increase the supply of inherited ability is hampered by lack of information about the distribution and frequency in the population of those persons who possess the various desired types of intelligence and personality. No satisfactory classification now exists of those special abilities which are needed by a modern society, such as ours. Nor are fully reliable methods available for identifying the persons who exhibit the desired qualities. The accuracy of the current estimates of differential fertility among the several occupational, economic, educational, and social classes leaves much to be desired. It is impossible with our present meager knowledge to estimate the current rate of decrease in the frequencies of those genes that affect intellectual capacity or to plan effectively for their increase.

The inadequacy of our information about these important matters has been noted by numerous psychologists, sociologists, and biologists. Research in this field, unfortunately, is not receiving nearly as much attention as its importance demands. The major reason for this neglect undoubtedly is the complexity of the problems involved. The isolated research worker on some university campus can at best make only slow progress in this difficult field of investigation. For their solution these complex problems will require the concentrated efforts of research teams composed of persons trained in the several special disciplines which are directly concerned (Snyder, 1951; Scheinfeld, 1958). Only a permanent research institute with an adequate staff can effectively investigate concurrently the numerous interrelated psychologic, economic, social, and genetic problems which are involved in the production of superior intellectual capacity.

PROPOSAL FOR A RESEARCH INSTITUTE

A research institute dedicated to investigations in the field of human abilities should be organized immediately. To be successful such an institute must have strong and permanent financial backing. Any large foundation which has uncommitted funds might well con-

sider this opportunity. Another possibility would be the organization of such a research institute in the Department of Health, Education, and Welfare. The National Institute of Mental Health, under the Public Health Service, currently is supporting some investigations of the genetics of mental traits. The comprehensive attack which is needed, however, demands the organization of a new institute with its own permanent staff.

In addition to investigations of the numerous genetic and environmental factors that control or affect the development of human abilities, the proposed institute could profitably make surveys of the distribution and frequency of occurrence of the various types of special talent among the people of the nation. Another desirable activity would be to secure reliable information about the magnitude of the differences in reproductive rate which currently are exhibited by the several occupational, economic, social, and educational classes in our society. Studies designed to improve the identification of potential ability early in school life also would be highly useful. By conducting investigations and surveys such as these, and others of a related kind, an institute dedicated to research on human abilities could be of incalculable value.

HOPE FOR THE FUTURE

When reliable information becomes available about the degree to which each type of special ability is inherited, about those environmental factors which may affect the development of the talents which each individual may possess, and about the distribution of mental capabilities in the population, then I am confident that our citizens can be depended upon to take the necessary steps to conserve and to increase the total supply of talent.

Mental ability and character are the most valuable resources that the world possesses (Wolfle, 1954). These resources should be utilized to the highest possible degree. The total supply of ability also should be increased. Any steps which will induce an increased proportion of capable young people to devote themselves to the types of work for which they are individually best suited or which will provide them with better training will be of immediate value to society. Any steps which will result in an increase in the proportion of mentally superior persons in the population will be of inestimable value to the world of the future.

SUMMARY

As civilization grows in complexity, the demand for mental abilities of many diverse kinds steadily increases. Mental ability is based in considerable part on the various elements of intelligence and is influenced by many items of personality. In its development mental ability is shaped by training and education and is affected by health and by other environmental factors. Many or perhaps all the hereditary factors involved in the production of superior intelligence and personality are believed to be based on multiple genes.

An adverse differential fertility in respect to mental capacity is probably now occurring in all Western countries and this presumably tends to decrease in each generation and in each century the frequencies of those genes that underlie superior ability. Practically no scientific knowledge, however, is available as to the actual rate of such deterioration.

The only known way for increasing the proportion in the population of per-

sons with superior mental capacity is to provide conditions under which those individuals who are above average in ability will have larger families than those who are below average. Those persons who rate above average in mental ability and personality should be encouraged to have as many children as they can properly rear and educate. This encouragement may be economic, social, or psychological. It should be based on an ever-increasing fund of knowledge. To this end, sound genetic advice should be made available in every part of the nation. The number of heredity counseling centers should be increased. Each of these centers should have facilities for giving advice about mental superiorities as well as about physical and mental defects.

Part of the lesser fertility of intellectual workers compared to other types of workers is due to the older average age at which they marry and start their families. To enable advanced students to marry and to start their families while in graduate or professional school, it is here recommended that (1) a tuition scholarship be granted to every graduate student who has been accepted by a competent university as a candidate for the master's or Ph.D. degree or equivalent; (2) the number of teaching and research assistantships available to graduate students be increased; (3) dependency allowances for a wife and for children be provided in each graduate assistantship and fellowship; and (4) long-terms loans on liberal terms be made available to every student who is engaged in graduate or professional training.

The organization of a national institute dedicated to research on the factors that produce or affect superior mental ability is strongly recommended.

REFERENCES

CATTELL, R. B. 1950. Personality: *A Systematic, Theoretical and Factual Study.* New York: McGraw-Hill.

————. 1957. *Personality and Motivation; Structure and Measurement.* Yonkers-on-Hudson: World Book Co.

DICE, LEE R. 1955. *Man's Nature and Nature's Man: The Ecology of Human Communities.* Ann Arbor: University of Michigan Press.

DOBZHANSKY, TH., and G. ALLEN. 1956. Does natural selection continue to operate in modern mankind? *Amer. Anthrop.* **58**: 591-604.

DORN, HAROLD F. 1947. Present knowledge concerning the effects of differential fertility in the United States. *Milbank Memorial Fund Quarterly,* **25**: 359-366.

FULLER, J. L. 1954. *Nature and Nurture: A Modern Synthesis.* New York: Doubleday.

GRABILL, W. H., C. V. KISER, and P. K. WHELPTON. 1958. *The Fertility of American Women.* New York: John Wiley and Son.

HAMMONS, HELEN G., Ed., 1959. *Heredity Counseling.* New York: Paul B. Hoeber.

HOLMBERG, ALLAN R. 1950. Nomads of the long bow: the Siriono of eastern Boliivia. *Publ. Inst. Soc. Anthrop.,* Smithson. Inst., **10**: 1-104.

HOLMES, S. J. 1921. *The Trend of the Race.* New York: Harcourt, Brace, and Co.

————. 1933. *The Eugenic Predicament.* New York: Harcourt, Brace, and Co.

————. 1936. *Human Genetics and Its Social Import.* New York: McGraw-Hill.

HUNT, HARRISON R. 1930. *Some Biological Aspects of War.* New York: Galton Publishing Co.

KALLMANN, FRANZ J. 1953. *Heredity in Health and Mental Disorder.* New York: W. W. Norton and Co.

KISER, CLYDE V. 1952. Fertility trends and differentials in the United States. *J. Amer. Statistical Assoc.,* **47**: 25-48.

MULLER, H. J. 1950. Our load of mutations. *Amer. J. Human Genetics,* **2**: 111-176.

NEEL, JAMES V. 1958. The study of natural selection in primitive and civilized human populations. *Human Biol.,* **30**: 43-72.

NEEL, JAMES V., and WILLIAM J. SCHULL. 1954. *Human Heredity.* Chicago: University of Chicago Press.

OSBORN, FREDERICK. 1951. *Preface to Eugenics.* Rev. ed. New York: Harper and Bros.

————. 1956. Galton and mid-century eugenics. *Eugenics Rev.,* **48**: 15-22.

PENROSE, L. S. 1955. Evidence of heterosis in man. *Proc. Roy. Soc.* London, B, **144**: 203-213.

POPULATION REFERENCE BUREAU. 1956. The college study report—1956. *Population Bull.,* **12**: 89-105.

————. 1958. Recession in births? *Population Bull.,* **14**: 109-123.

SCHEINFELD, AMRAM. 1958. Changing attitudes toward human genetics and eugenics. *Eugenics Quart*, **5**: 145-153.

SNYDER, LAURENCE H. 1951. Old and new pathways in human genetics. *Amer. J. Human Genetics*, **3**: 1-16.

VANDENBERG, STEVEN G. 1956. The hereditary abilities study: The University of Michigan. *Eugenics Quart.*, **3**: 94-99.

WESTOFF, CHARLES F. 1954. Differential fertility in the United States. *Amer. Sociological Review*, **19**: 549-561.

WOLFLE, DAEL. 1954. *America's Resources of Specialized Talent.* New York: Harper and Bros.

WRONG, DENNIS H. 1958. Trends in class fertility in Western nations. *Canadian J. Econ. and Pol. Sci.*, **24**: 216-229.

FAMILY PLANNING PRACTICE AMONG THE JAPANESE*

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AN INTENSE DESIRE to limit family size became widespread in Japan after the last war. What has drawn the attention of those interested in human fertility throughout the world to Japan is not the simple fact of stated wishes for smaller families. This wish exists in varying degrees in many countries. The extraordinary fact is that the Japanese people used the means available to them and actually had the smaller families that were their stated goals. In 1947 the number of births per 1,000 population was 34.3; in 1957, it was 17.2. This was a reduction of 50 per cent within a decade. It is recognized that the 1947 rate was unduly high. None the less, the decline was phenomenal.

One of the really significant aspects of intensified efforts of the Japanese to adjust the numbers of their offspring to the environment in which they found themselves was the strength of the motivation in the general public. Official sanction for birth limitation was expressed by the government in a legal document that was permissive only. The government statement undoubtedly had something to do with the rapidity of the spread of family limitation throughout the country. The most significant factor, however, was the desire of the average couple to control the number of children they would have. It is the personal opinion of the author that a level of birth limitation similar to that existing today would have been attained in the absence of governmental support for it, though it probably would have taken a somewhat longer period of time.

As is well known ,the practice of birth limitation has a long history in Japan. Infanticide and abortion are presumed to have been quite widespread in the days of the Tokugawa Shogunate. When the level of living was seriously threatened after the last war, many Japanese couples displayed the traditional reaction to adverse circumstances by using induced abortion. Even today, the total number of induced abortions, including those not reported, may exceed the total number of live births. The focus of the present program of the promotion of family planning in Japan is that of public health. The problem is one of means. How can we shift from induced abortion to the prevention of conception? The total effort to reduce births has already been successful if the measurement is solely in quantitative terms. The question of techniques used to achieve the ends of family limitation rather than the ends themselves arouses the most vigorous discussion in Japan today. The hope is that there may be a shift in means of birth limitation. There is an expecta-

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tion of progress toward this goal of altered means in the future, though it is recognized that progress may be slow.

There was a rapid increase of population in Japan after the war. Despite the repatriation of some seven million civilians and members of the armed forces to Japan, the major factor in the increase was the surplus of births over deaths. There was a temporary increase in the birth rate in the early postwar years, but the most extraordianry event was the rapid and continuing decline in mortality. The extensive application of improved public health and sanitation was the major factor in the increased rate of population growth in Japan. Thus from the beginning, the postwar population problem was linked closely with public health. This association of public health with overall population problems was further strengthened when the issue became concentrated more upon medical discussion of the advisability or inadvisability of the methods employed: induced abortion versus contraception.

A most significant observation the author wishes to make here is that the government-sponsored program for the dissemination of contraception in Japan was adopted primarily from the standpoint of public heath and welfare. It came into existence because of the recognition of a responsibility on the part of public health workers for dealing with the birth rate as well as the death rate, if they were really to advance the welfare of the people. The program became part of general health measures because family planning practice was vitally important in its influence on the well-being of each individual and family.

In the last decade, the birth-control movement was very actively advocated as a possible solution to the overall population problems, chiefly by those concerned primarily with the economy of the nation. Many official organs, such as committees or councils, were set up at the national level in order to cope with the extraordinary problems of population growth. But the difficulty of adopting a negative population policy by a government is quite apparent in the general fate of these organizations. They submitted many resolutions, often including heavily loaded statements concerning drastic measures to be employed for population control. In general, their proposals remained proposals only, seldom accompanied by adoption or enforcement. The implication of these observations is noteworthy indeed, especially when we know that this course of events came in Japan where people were more or less population-minded.

The major force for carrying out the program for the promotion of family planning by means of contraception has been within the framework of the Ministry of Welfare of the Japanese government. The main justification for permissive legislation on abortion and contraception was the health of mothers and children. As has been noted earlier, the decline in the birth rate that resulted from the health-and-welfare-oriented programs was remarkable. There is little question but that the reduction in the birth rate in Japan and hence in the rate of population growth contributed substantially to the recovery from the devastation of the war. It is admitted that reduction in the birth rate was brought about mainly by induced abortions rather than by the program for contraception which is the primary function of the public health activities within the Ministry of Welfare.

Under these circumstances, it is pertinent to describe some of the most im-

portant aspects of the findings in the family planning field surveys carried out by the Institute of Public Health, an organization attached to the Ministry of Welfare. The main responsibility of the Institute of Public Health is research and training in matters concerning public health and welfare. It is hoped here to give a fair understanding of the survey results themselves and their implications for the situation in the nation at large.

The main studies the author wants to describe here are a series of field investigations which come under the general heading of "test studies of family planning" or "pilot studies of family planning education." The purpose of these pilot studies was to demonstrate how best people could be induced to practice family planning and to find out the acceptability of various methods as well as the nature of difficulties involved in the whole process of family planning education.

The populations covered by this series are broadly classified into three categories: rural communities represented by three typical farming or fishing villages, coal mine workers in one of the largest private enterprises, and a special group of people who are under the care of public relief. The rural village studies were initiated in 1950, and the studies of coal miners and public relief people are of comparatively recent origin, both commencing in 1953. Rural communities were selected because of the recognition of the importance of family planning among farmers who are still a large group in the population. Coal mine workers were studied because of the value of family planning to more efficient management in the coal industry. Interest in the study of public relief population was aroused because of the challenge involved. This specific group was supposed to be most difficult to deal with in any kind of education that called for planning.

In all of these different groups more or less similar procedures were followed in the educational activities. The first step was concerned with general education in the broad principles of family planning. Usually the director of the Institute of Public Health assumed the responsibility for the initiation of the work. He went to the people and discussed the possible advantages of the planned family over the unplanned family. Movies, lantern slides, reading materials such as pamphlets and leaflets, and other teaching aids were utilized. Efforts were made to use plain language in order to secure full understanding. Special consideration was given to inviting as many people as possible, including even those to whom childbearing was out of the question because of age, so that the feeling could be created that family planning was not merely a matter of concern to a few individuals. Futhermore, it was regarded as essential that a medical doctor or a person in the medical profession should be in charge of the program. This approach helped the people concerned to develop strong confidence in their educators and to overcome the shyness inherent in matters relating to sex.

The second step was group education. On the average ten to fifteen women were invited to attend, and a more detailed account of the various methods of family planning was given. As a rule, charts and models were used and actual samples of devices and chemicals were passed around during the explanations. Not infrequently, the meeting was very quiet for the first ten minutes after the doctor's talk. Each woman would watch

her neighbors to see if somebody else would not raise the question that she herself was most anxious to ask. The women cast glances at each other with peculiar mixtures of shyness and curiosity. Once some one was brave enough to ask a straightforward question, there was a break through the reserve. The meeting then turned into a flow of frank questions and answers, and the goal of getting the women acquainted with various techniques was satisfactorily accomplished.

The third level was individual education in which each woman was invited to talk with a doctor face-to-face. Usually different contraceptive methods were suggested, the final choice being left to the woman herself. At the same time, the woman was always told that she might change the method later in case the first one had failed to satisfy either her or her husband.

As implied in the above descriptions, most of our education was directed to women. Later in our experiences with pilot studies, we made efforts to include men as far as possible. An outstanding discovery in the education of men was that, if given proper opportunities to discuss family planning scientifically, men were really interested in the information, oftentimes more genuinely so than women. They frequently had more accurate understanding about the methods. The author personally knows a number of husbands who calculate the safe period themselves correctly and give the results to their wives.

In regard to the acceptability of various methods among the couples studied, simple generalization is inappropriate and difficult. The findings differ considerably from one group to another. However, some of the most important factors may be listed here.

As is the case in Japan as a whole, the most popular method among the couples observed was the condom. It was used by nearly half the couples in the rural villages. Among the coal mine workers and public relief population it was the method chosen by a little over half. Furthermore, it was the general observation that the proportion using the condom tended to increase as the education program continued. A cogent explanation for this tendency would have to include two factors. One is the possibility of more and more husbands becoming cooperative as education proceeds. The other is the desire of a couple to use the most reliable means once fully convinced of the value of family planning. If the decision as to means is left to the couple, a compromise is involved between how disagreeable and troublesome the method is on the one hand and how effective it is on the other. As long as a couple has only limited motivation to control fertility, the chances are that they may choose the least disagreeable and least troublesome method. As the couple becomes more intensely motivated to limit births, reliability becomes an increasingly important characteristic of the contraceptive means. Hence increasing proportions of the couples turn to the condom or the diaphragm. If the husband as well as the wife is really interested, then the choice between these latter two methods is the simpler of the two: the condom.

In any event, this general observation that the use of condom ranks first deserves special attention, because it illustrates the relatively great cooperation given by husbands to the practice of family planning in Japan, contrary to the general criticisms of them for the lack of such cooperation. We have also noted many instances in which the de-

cision for family planning was mutual rather than that of the wife alone.

In regard to the diaphragm, our general impression is that there are serious obstacles to widespread use of this method, especially among the less privileged. The proportion of couples using this method increased gradually among the farmers and coal miners under our observation, but there was little possibility for the public relief population to depend on it. Housing conditions, particularly the lack of privacy and of washing facilities, were the chief factors responsible.

Methods requiring less manipulation, such as tablets, had considerable efficacy. That practical usefulness counts more than theoretical effectiveness was also fully demonstrated in our pilot studies.

In order to evaluate the results of these studies, analyses have been made from time to time of such indices as the birth rate, pregnancy rate, reproduction ratio, number of induced abortions, number of sterilizations and so forth. Also, inquiries were made as to the reasons for failures in conception control, for a change from one method to another, for induced abortions as well as for sterilizations, etc.

The results observed from these analyses and inquiries may be given as follows:

1. The birth rate was reduced by half or more in these various groups in the course of three to five years of education. Admittedly the birth rate is too crude an index to analyze the progress accurately in small populations, but in general the birth rates dropped rapidly to levels far below the national average.

2. The drop in the pregnancy rate was also appreciable.

3. The number of induced abortions fell in most cases to almost half the pre-education level. About 70 per cent of the reduction of the birth rate in study areas is accounted for by the practice of contraception, whereas the corresponding figure for Japan as a whole may be only 25 to 30 per cent. However, we met difficulties in our efforts to reduce the number of induced abortions. In the rural villages as well as in the coal-mine districts, the number of induced abortions rose somewhat in the year after the initiation of the program. Apparently some women already pregnant when the general education in family planning was started resorted to induced abortion as they became small-family-minded because of the education. Also, there were more failures in conception control during the early stage of the program as the couples were not fully accustomed to the use of the methods they had selected.

Furthermore, there is a most serious obstacle to the substitution of contraception for abortion. An induced abortion can be procured without difficulty, especially in the coal mine and public relief groups. In almost all instances, among these groups, a woman can have an induced abortion through the health insurance system of the company or provisions made by the social security program. The operation costs little or nothing, and the medical facilities are always available in the areas concerned and within easy access. The only possible counter-measure to abortion, it was believed, was to educate and re-educate the people in the desirability of conception control rather than induced abortion. In the case of our pilot studies, this has been reasonably successful. In the general population of Japan, for whom the educational program by experts is rather limited, the substitution of contraception for abortion is a difficult problem.

4. Although we did not recommend a sterilization operation as a solution to excessive childbearing, the number of those sterilized, almost all of whom were women, has increased slowly but steadily.

5. In dealing with a typical farming village in Japan, one is sure to have a preconception that children are assets rather than liabilities to a farmer's family. We were particularly interested in this idea when we began to introduce the principles of family planning. Our general observation revealed that this tendency still existed in the rural villages studied. This did not mean that a farmer always wanted to have a great many children. As a matter of fact, the people in these communities were very receptive to what we taught them. The desire to have just enough children, but not too many—in most cases, 2 or 3—is becoming popular among farmers in Japan. This may be illustrated by citing one or two statistics obtained from our experiments in the three rural villages. After five-years' education, 98.5 per cent of those couples who needed to practice conception control for one reason or another were actually using some method of limitation. This proportion is a little higher than the corresponding figures observed in other pilot areas. Furthermore, we intentionally cut down educational activities for village people in the third year after the program was initiated in order to see how it would affect the general course. Our follow-up showed that the birth rate continued to decline. Then, in the fifth year, our activities were again strengthened. This time, no further substantial decline was recorded, no matter how strenuous the efforts, suggesting that the birth rate had reached the lowest possible level.

6. The general observation about the strong desire to control size of family among the Japanese as a whole can be applied to those in the lowest social stratum, such as the population on public relief. Of course, a difference in the intensity of the desire among different social strata must be admitted. In general, however, the cooperation shown by this specific group was much more favorable than had been anticipated. Apparently there exists a certain form of "inferiority complex" among these individuals. Considerable success in the extension of education in family planning to the under-privileged could be expected only if special efforts were made to establish confidence in the program. There would have to be really warm and sympathetic counseling opportunities.

7. Midwives are key personnel who are always in close contact with the people. Wives can talk to the midwives freely about sex, and at the same time the midwives are uniquely familiar with the family conditions in most households.

SUMMARY

These pilot studies have done a great deal in serving as demonstrations of family planning education. A criticism often made in and outside Japan is that the studies have demonstrated what could be done under ideal conditions, with medical doctors and auxiliary personnel such as trained midwives stationed in the areas. According to this argument, the studies have failed to show what could be done where both facilities and resources are limited. In reply, we may frankly admit that the purpose of the studies was the demonstration of what could be done under optimum conditions. However, we do find that the studies have had strong repercussions at local, prefectural, and national levels.

Many other villages and companies have wished to set up similar patterns of work for the teaching of family planning. There are many "prefectural test villages," "family planning model companies," and so forth.

At the central level, the materials of the studies were used for references when the planning of nation-wide programs was called for. More specifically, they have helped to establish a special national program for the distribution of contraceptive materials free of charge or at reduced costs to those couples who want to practice conception control but cannot afford to purchase the materials themselves.

In addition to the pilot studies of family planning education, the Institute of Public Health has conducted relatively detailed field surveys in regard to induced abortion and sterilization as used among couples whose operations were reported officially to the health authorities concerned. Comparatively more comprehensive publications have been published on these studies, and most of them are available in English. Only a few remarks with regard to the results derived from them may be made here.

It was found that the true reasons for having the operations performed were predominantly economic in the broadest sense. About three-quarters and two-thirds of the couples personally interviewed stated, respectively, the reasons for induced abortion and sterilization as a limited amount of income which did not permit them to have another child, the large expenses required for the education of the children they already had, or sometimes, only "We have had enough children." The author was particularly impressed with the frequent statement that the education of children was so important because the poor education of the husbands was responsible for the present low social standing of the family. For this reason, every possible effort would be made not to repeat the same experience in their children.

Also, it was noted that induced abortion and sterilization were alternatives to the practice of conception control in the purpose of a voluntary spacing and regulation of the number of children. Some of the Japanese demographers once reported that about half the pregnancies which occurred as a result of failure in conception control would be terminated by induced abortion. A common observation in our studies was that a sterilization operation was finally resorted to after some unsatisfactory experiences with contraceptive measures accompanied by repeated induced abortions.

There are many significant relationships in considering the means of birth limitation. It has been noted that the professional advice of a physician was important in the decision of a woman to have a sterilization operation. And the widespread performance of induced abortions provided contacts for women with medical doctors. The finality of the sterilization operation usually precluded an easy decision by the woman. The advice of a doctor then might be strong enough to tip the scales for the final decision.

In brief, then, these studies indicated that induced abortion and sterilization could hardly be avoided because of the extremely rapid transition that occurred after the war. The desires of the people went far ahead of the provision of facilities for the fulfillment of such desires through the more reasonable methods of conception control. In Japan, the great transition from high to low birth rate took only ten years or so in con-

trast to the earlier experiences of the West where the processes moved rather slowly. In order to achieve the same level of progress in a much shorter period of time and with much greater urgency, people may often have to use some drastic measures, even though fully aware of their inadvisability.

So far as the number of reported induced abortions in Japan as a whole is concerned, it seems the trend has already passed its peak year. The recent level is in the neighborhood of 1.1 million induced abortions as contrasted to 1.6 million births. However, the author thinks that the *total* number of induced abortions may still represent almost twice the reported number. The tendency, increasingly strong in the past several years, to have an induced abortion performed quite early during pregnancy is usually regarded as an indication of the decrease in the emotional resistance against it. However, it should also be noted that recent findings indicate a growing dislike for abortion as a method of family limitation.

In regard to the sterilization operation, a similar tendency holds true. The reported numbers have increased little in recent years. Opinions as to this definitive procedure of family limitation are varied among the experts concerned, but in general there is an increasing tendency to emphasize the necessity for careful precautions before resorting to sterilization.

Among couples with wife under 50 years old, probably some 40 per cent practice some type of contraception. A general trend is that more young couples are taking up family planning as real planning in the early stage of their married life, not because of necessity after the family has reached the desired size.

Finally, the author wishes to emphasize once again the importance and the value of basic education in the principles of family planning. It is obvious that the success of any program designed to facilitate the easy practice of family planning, such as the program for the universal availability of contraceptive materials, is very difficult unless it is preceded by a strong effort to ensure full understanding of the ideals of family planning. In the case of Japan, this task was accomplished without much difficulty, for the favorable motivation was there already. In a country where the idea is introduced as something unfamiliar, the instillation of motivation would require unusual effort and contrivance rather than the actual execution of the project itself.

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INTERMARRIAGE AND FERTILITY PATTERNS AMONG PERSONS IN MAJOR RELIGIOUS GROUPS*

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NEITHER VITAL STATISTICS nor decennial census figures have provided nationwide statistics on marriage and family patterns among the several religious groups, even though religion has been one of the central characteristics of American culture. A part of the gap can now be filled by data collected by the U. S. Bureau of the Census in March 1957, in connection with the Current Population Survey. (1) This nationwide survey covered a sample of 35,000 households selected scientifically to represent all elements in the population of the nation. An analysis of some of the results of this survey is presented in this paper.

The question on religion was worded as follows: "What is your religion—Baptist, Lutheran, etc.?" The question was restricted to persons 14 years old and over, because some religious groups regard baptized infants as members and others count as members only persons who have "joined" at about 12 to 14 years of age or older. This difference in practice would undoubtedly affect the replies to such a question for persons under 14. In the 1957 survey, the answers to all questions were voluntary; only one per cent failed to give a reply to the question on religion.

The intent of the question was to elicit each person's religious preference, though the same reply would be expected from most of the people regardless of the phrasing of the question. A preference question maximizes the proportion of the people who can be classified into the several religious groups and avoids the necessity of prescribing such a limiting criterion for inclusion as membership or attendance, both of which present some serious problems of definition. A preference question has the shortcoming, however, of drawing into the count for a given denomination some persons whose attachment to the group is nominal. It is possible that differences between the religious groups with respect to subjects discussed below would have been more distinct if the groups had been more narrowly defined.

DEMOGRAPHIC CHARACTERISTICS

Separate response categories were provided on the enumeration document for each of the six largest religious groups, as shown by official membership figures: Roman Catholic, Baptist, Methodist, Lutheran, Jewish, and Presbyterian. Other categories were also provided for "other Protestant," "other religion," and "no religion." For these groups, data were tabulated for persons 14 years old

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and over and, in addition, estimates of the number under 14 years old in each of the major groups were made by classifying family members under 14 according to the religion reported by the family head and his wife (if any). In families with mixed marriages, the author classified half of the children according to the religion reported by the head and half according to that of the wife. (See footnotes in Table 1.)

The findings in Tables 1 and 2 show

TABLE 1
CIVILIAN POPULATION IN THE MAJOR RELIGIOUS GROUPS BY AGE, FOR THE UNITED STATES: MARCH 1957

Religion and Color	*Total Civilian Population*[1]		*Percent by Age*				*Median Age* (years)
	Number	Percent	All ages	Under 18 years[1]	18 to 64 years	65 and over	
Total	168,122,000	100.0	100.0	34.9	56.4	8.7	29.9
Protestant	111,533,000	66.3	100.0	35.1	55.7	9.2	29.9
White	95,330,000	56.7	100.0	34.0	56.2	9.8	30.9
Nonwhite	16,203,000	9.6	100.0	41.8	52.4	5.7	24.2
Roman Catholic	44,040,000	26.2	100.0	36.3	56.7	6.9	28.5
Jewish	5,013,000	3.0	100.0	27.8	62.2	10.0	36.6
Other religion and not reported	3,264,000	1.9	100.0	24.9	62.6	12.5	37.2
No religion	4,272,000	2.5	100.0	30.0	59.7	10.3	32.8

[1]Figures for children under 14 years old were estimated from religion reported by family head and wife. About 4 million of the 49 million children under 14 lived in families with head and wife reporting different religions; one-half of these children were assumed to have the religion of the head and one-half the religion of the wife. Ratio of persons 14 to 17 years old to persons 14 to 19 years old assumed to be the same for each religious group.

Source: Derived from U. S. Bureau of the Census, "Religion Reported by the Civilian Population of the United States: March, 1957," *Current Population Reports*, Series P-20, No. 79.

TABLE 2
RELIGION REPORTED FOR THE CIVILIAN POPULATION 14 YEARS OLD AND OLDER, BY COLOR AND SEX, FOR THE UNITED STATES: MARCH 1957

Religion and Color	*Both Sexes* Number	Per cent	Male, per cent	Female, per cent
Total, 14 and over	119,333,000	100.0	100.0[1]	100.0[2]
White	107,361,000	90.0	90.1	89.8
Nonwhite	11,972,000	10.0	9.9	10.2
Protestant	78,952,000	66.2	64.7	67.5
Nonwhite	10,477,000	8.8	8.4	9.1
Baptist	23,525,000	19.7	19.4	20.0
Nonwhite	7,253,000	6.1	5.8	6.3
Lutheran	8,417,000	7.1	7.1	7.0
Methodist	16,676,000	14.0	13.5	14.4
Nonwhite	2,067,000	1.7	1.7	1.8
Presbyterian	6,656,000	5.6	5.3	5.8
Other Protestant	23,678,000	19.8	19.3	20.4
Roman Catholic	30,669,000	25.7	25.7	25.7
Nonwhite	774,000	0.6	0.6	0.7
Jewish	3,868,000	3.2	3.2	3.2
Other religion	1,545,000	1.3	1.4	1.2
No religion	3,195,000	2.7	4.1	1.4
Nonwhite	414,000	0.3	0.5	0.2
Religion not reported	1,104,000	0.9	1.0	0.9

[1]Based on 57,470,000 males 14 years old and over.
[2]Based on 61,863,000 females 14 years old and over.
Source: Same as Table 1.

that two out of every three persons in the United States in 1957 (66 per cent) were reported as (or estimated to be) Protestants, one out of every four (26 per cent) as Roman Catholics, three per cent as Jewish, one per cent as reporting some other religion, and three per cent as reporting no religion; one per cent made no report on religion.

Age—Figures on Protestants (by color), Roman Catholics, and Jews by key age brackets — young dependent ages, major productive ages, and old age — bring out the following points: At the extremes, nonwhite Protestants had a far larger proportion of young dependents than the Jews (42 per cent versus 28 per cent). White Protestants and Roman Catholics were intermediate and had about the same proportion of young dependents (34 and 36 per cent, respectively). At the same time, nonwhite Protestants had the smallest proportion in the productive ages and the Jewish population had one of the largest. In the old age bracket were smaller percentages of Protestant nonwhites and Roman Catholics than white Protestants and Jewish persons.

The median ages provide a convenient means for summarizing the differences in age groupings. Thus, the median age for nonwhite Protestants was 24 years, that for Roman Catholics was 29 years, that for white Protestants, 31 years, and that for Jews, 37 years.

The age differences reflect such factors as differences among the religious groups with respect to major period of immigration of the persons (or of their ancestors) and with respect to their birth and death rates during past decades. Persons reporting "other religions" include mainly Eastern Orthodox Catholics and Orientals, many of whom migrated to the United States several decades ago and are now in old age. A relatively large proportion of those reporting no religion were in the adult age groups. It would be of interest to know how many of the middle-aged and older persons reporting no religion would have reported one in their earlier years, and to know how many of them would have reported each religion.

Sex—The percentage of *men* who were reported as Catholics was the same as the percentage of women who were reported as Catholics; likewise for Jewish men and women (Table 2). But three per cent more of the *men* than women reported no religion and three per cent more of the *women* than men reported themselves as Protestants. It would be informative to know how many of the men reporting no religion worked in relatively isolated places where there were no religious organizations, and how many were merely indifferent toward religion.

Color — Seven-eighths of the nonwhites, as compared with five-eighths of the whites, were reported as Protestants. Six per cent of the nonwhites and 28 per cent of the whites were reported as Roman Catholics. So nearly are all nonwhites Protestants that almost any generalization which applies to nonwhite Protestants applies likewise to all nonwhite persons.

Region—In the South, 83 per cent of the persons of all races were reported as Protestants, as compared with 42 per cent in the Northeast and 69 per cent in the North Central region and the West. Approximately half of those reported as Roman Catholics and two-thirds of those reported as Jewish were living in the Northeast. The Northeast had the smallest proportion reporting no religion and the West had the largest (4 per cent).

Residence—Among persons reported as Jewish, 96 per cent lived in urban areas. The corresponding proportion was 79 per cent for those reported as Roman Catholics, 57 per cent for those reported as Protestants, and 54 per cent for those reporting no religion.

The unequal distribution of persons in the several religious groups according to the key demographic variables is relevant to the following discussion of family data on religion. (2)

INTERMARRIAGE

In view of the fact that about two-thirds of the adults in the United States are reported as Protestants, it would be theoretically possible for every Roman Catholic and every Jewish person to marry a Protestant. In such a hypothetical situation, rates of interfaith marriages for the Roman Catholics and Jews would be 100 per cent but that for Protestants would be less than 50 per cent.

Again, if religious ties were not strong and if other factors, such as race, social class, and geographic location were not to affect the selection of partners in marriage, persons in each religious group would tend to marry persons in any religious group on a random basis. In actual practice, of course, Protestants generally marry Protestants, Catholics generally marry Catholics, and Jews generally marry Jews. The question under discussion is the proportion of the couples who marry in or marry out of their religious group.

From the survey results on religion, it was possible to estimate the actual extent of intermarriage, for comparison with the amount which would have been "expected" on a random basis. Computations were made for married couples in which the husbands and wives were reported as Protestant, Roman Catholic, or Jewish. In this study, a Protestant husband with a Protestant wife was considered as a couple belonging to the same religious group, regardless of whether they were members of the same or different Protestant denominations.

The findings showed that 94 per cent of the married couples consisted of husbands and wives of the same major religious group. If the couples had been paired off without regard to the religion of their marriage partner, only 56 per cent of them would have had a spouse of the same religion; 44 per cent would have been married to a person in one of the other two major groups. In Table 3 corresponding figures are shown for each of the groups.

Among the couples with either a Protestant husband or a Protestant wife, both the husband and wife were Protestants in 91 per cent of the cases; in the remaining 9 per cent, one of the spouses was reported as a Roman Catholic or a Jew. For couples involving at least one Roman Catholic, 78 per cent were unmixed Roman Catholic couples and 22 per cent were mixed Catholic-Protestant or Catholic-Jewish couples. And for couples involving at least one Jewish partner, 93 per cent were unmixed Jewish couples and 7 per cent were mixed Jewish-Christian.

If all of these couples had consisted of persons of one of the religious groups or another at random, 47 per cent of the Protestants would have been in mixed marriages, instead of the actual 9 per cent. In other words, there were actually only about one-fifth (19 per cent) as many Protestant-Catholic or Protestant-Jewish couples as would have been expected on a random basis.

The rate of mixing was only slightly larger for couples with one or both Roman Catholic spouses. Thus, the actual

TABLE 3

ACTUAL INTERMARRIAGE RATES AND INTERMARRIAGE RATES "EXPECTED" IF HUSBANDS AND WIVES WERE DISTRIBUTED AT RANDOM, FOR MARRIED COUPLES IN THE UNITED STATES WITH HUSBAND AND WIFE PROTESTANT, ROMAN CATHOLIC OR JEWISH: MARCH 1957

Religion of Husband and Wife	*Married Couples* Actual Number	Actual Per cent	*"Expected" Per cent if Random Intermarriage*	*Ratio of Actual to "Expected" Mixed Marriages*
One or both Protestant	26,916,000	100	100	—
Protestant—				
Protestant	24,604,000	91	53	—
Roman Catholic or Jewish	2,312,000	9	47	.19
One or both Roman Cath.	10,657,000	100	100	—
Roman Catholic—				
Roman Catholic	8,361,000	78	16	—
Protestant or Jewish	2,296,000	22	84	.26
One or both Jewish	1,356,000	100	100	—
Jewish—				
Jewish	1,258,000	93	2	—
Protestant or Roman Cath.	98,000	7	98	.07

Source: Same as Table 1.

mixture rate for Catholic spouses was 22 per cent and the expected rate was 84 per cent, making the actual rate only about one-fourth (26 per cent) as large as the expected rate. The minor differences which appear to exist between the mixture rates for Protestants and Catholics suggests that there is a higher rate of Catholic-Jewish than Protestant-Jewish intermarriage; the sample figures on such couples are quite small.

For couples with one or both Jewish partners, the ratio of the actual mixed marriage rate to the expected marriage rate was only about one-third that of Protestants or Catholics. Specifically, only 7 per cent of the couples with at least one Jewish partner had a Christian partner, whereas fully 98 per cent would have done so if they had married without regard to the religion of their partner in marriage. Hence, only 7 per cent as many Jewish persons outmarried as would have been expected by chance alone. The relatively low intermarriage rate for Jewish persons is no doubt a result in part of such factors as geographic concentration of Jewish population in urban neighborhoods.

In interpreting these "intermarriage" (or interfaith) mixtures, it should be recognized that some persons change their religion after marriage to conform to that of their spouse, that some enumerators may have failed to follow the instruction to ask for the religion of each person in the household rather than to assume that all had the same religion as the respondent, and that some respondents may have, for one reason or another, misreported the religion of one of the spouses. Probably most of these factors would tend to make the Census Bureau's household survey figures show less mixture among the three major religious groups than marriage records show. (3)

Moreover, intermarriage among denominations within the Protestant group is not reflected in the preceding discussion. There may well be more cultural resistance to intermarriage of persons in some of the widely different Protestant denominations than between Protestants and Catholics or Jews, but the available data did not throw light on this subject.

Some persons reporting no religion may have ceased affiliating themselves with any religious group as a consequence of a conflict between their religion and that of their spouse. It is noteworthy, in this connection, that one million children under 14 years of age were living in families where the head reported no religion, whereas only about one hundred thousand children were in families where the wife reported no religion.

Finally, this study has not dealt with such related topics as differences in age at marriage and in the proportion who ever marry among the several religious groups. Thus, the findings may be affected by the extent to which Protestants tend to marry younger than Catholics and Jews and to which Catholics have a larger proportion in religious and educational work who never marry.

FERTILITY

Differences in the fertility rates for the several religious groups were measured in terms of the average number of children ever born per 1,000 women who had ever married (Table 4). Separate figures were compiled for women of childbearing age (15 to 44 years) and for women past the childbearing age (45 years and over). The rates for women of childbearing age are probably of more current interest than those for older women because they come closer to revealing eventual differences in reproductivity among women in the several religious groups who have been at the height of their childbearing during recent years; however, the rates for these women are affected somewhat by differences in age at marriage and in the timing of births after marriage.

For women of childbearing age, those reported as Baptists had the highest fertility rate. To some extent this finding may be attributed to the fact that about one-third of the Baptists are Negroes, and the fertility rate for Negroes is about 20 per cent above that of whites. Moreover, a majority of the Baptists—whether currently in urban areas or rural—have probably grown up in the environment of the rural South, where the fertility rates are above those for the nation as a whole.

Despite the common belief—and evidence from other studies—that Catholics have larger families than other persons, (4) the Current Population Survey showed that the fertility rate for Roman

TABLE 4

CUMULATIVE FERTILITY RATE (NUMBER OF CHILDREN EVER BORN PER 1,000 EVER MARRIED WOMEN), BY RELIGION REPORTED, FOR THE UNITED STATES: MARCH 1957

Religion	*Cumulative Fertility Rate*		*Difference*
	Women 15 to 44 Years Old	Women 45 Years Old and Over	
Total	2,218	2,798	580
Protestant	2,220	2,753	533
Baptist	2,359	3,275	916
Lutheran	2,013	2,382	369
Methodist	2,155	2,638	483
Presbyterian	2,001	2,188	187
Other Protestant	2,237	2,702	465
Roman Catholic	2,282	3,056	774
Jewish	1,749	2,218	469
Other, none, and not reported	2,069	2,674	605

Source: U. S. Bureau of the Census, *Statistical Abstract of the United States, 1958*, table 40. Based on data from Current Population Survey.

Catholic married women of childbearing age in the country as a whole was not significantly higher than that for married Protestant women in the same age group. (The fertility rates standardized for age, not shown in Table 4, were virtually identical for the two groups, namely, 2,206 for Protestants and 2,210 for Roman Catholics) The explanation lies, in part, in the fact that twice as large a proportion of Protestants as Catholics live in rural areas, and rural fertility rates are about one-fourth again as high as those in urban areas. Moreover, Protestants probably marry at a younger age than Catholics, on the average. Thus, although urban Catholic women may have higher fertility rates than other urban women, the survey figures indicate that Catholic women as a group in the entire nation do not have higher fertility rates than other women.

The fertility rate for Jewish women of childbearing age who had married was only about three-fourths as large as that for Protestant and Catholic women. As pointed out early in the paper, virtually all Jewish population in this country is found in urban areas, but the fertility rate for Jewish women was about 14 per cent below that for urban women of all religions combined. Also, according to independent studies, a relatively large proportion of Jewish workers is found in the professional and other white collar occupations, which require more than the average amount of education. (5) Women with husbands in such occupations tend to have 5 to 15 per cent fewer children than the national average. (The sample included only about 500 Jewish ever-married women 15 to 44 years old. This fact serves both as a caution in evaluating the results and as one of the reasons why the data are not shown in greater detail by related subjects.)

The (cumulative) fertility rates in Table 4 for women 45 years old and over reflect the fertility experience of earlier generations. Here, again, the Baptist women led all the rest, but the Roman Catholic women of this older age range had about ten per cent more children on the average than the entire group of Protestant women. The rate for the older Jewish women, as for the younger ones, was about three-fourths as high as the national average.

The fertility rate for women of childbearing age was about 600 points lower than that for women above childbearing age. This difference is not a mere reflection of the incomplete fertility of the younger women; it also arises, in part, from the fact that, despite the upturn in the birth rate during the 1940's, fertility rates today are still considerably lower than they were 40 or 50 years ago. The point to observe here, however, is that the difference between the fertility rates for women in the two broad age groups varied widely among the several religious groups. For example, the differences between the fertility rates of older and younger women among Baptists and Roman Catholics—clearly the most fertile of the older women—were the largest (about 800 to 900 points). At the other extreme, the Presbyterians had one of the lowest rates among both the younger and older women, and the difference for this denomination was the least (only about 200 points). These and other facts suggest a long-time trend toward the convergence of fertility rates among the religious groups.

SUMMARY AND CONCLUSIONS

The nationwide sample data collected by the Bureau of the Census in 1957 show that, among married couples with

the husband and wife reported as Protestant, Roman Catholic, or Jewish, about one-fourth to one-fifth as many couples included only one Protestant partner or only one Catholic partner as would have been expected if the persons had married without regard to religion. By contrast, one-fourteenth as many couples included only one Jewish partner as would have been expected on a random basis. Thus, the findings provide statistical evidence that intermarriage occurs much more readily among Protestants and Catholics than between Jewish persons and Christians.

Moreover, Protestant and Roman Catholic married women of childbearing age had borne approximately equal numbers of children per woman, on the average, even though a much larger proportion of Protestants live in, or grew up in, rural areas where fertility rates are relatively high. Among Jewish women of childbearing age and of older ages, the fertility rates were about three-fourths as high as those for the country as a whole. Differences between rates for those of childbearing age and rates for older women suggest a trend toward convergence of the fertility levels among women in the major religious groups.

Undoubtedly, the differences between the major religious groups with respect to marriage and fertility patterns which have been shown by the survey data reflect differences in the age, color, geographic, and socioeconomic distributions of these groups as well as differences in religious doctrines with regard to family behavior.

REFERENCES

1. Two Census publications contain all of the statistics published from this study: U. S. Bureau of the Census, "Religion Reported by the Civilian Population of the United States: March 1957," *Current Population Reports*, Series P-20, No. 79; and *Statistical Abstract of the United States, 1958*, table 40.
2. An extensive bibliography of statistical studies on religion is presented by Benson Y. Landis in "A Guide to the Literature on Statistics of Religious Affiliation with References to Related Social Studies," *Journal of the American Statistical Association*, Vol. 54, No. 286, June 1959, pp. 335-357.
3. See Harvey J. Locke, Georges Sabagh, and Mary Margaret Thomes, "Interfaith Marriages, *Social Problems*, Vol. IV, No. 4, April 1957, pp. 329-333. On pages 332 and 333 the authors state: "In 1955, of all Catholic marriages 27 per cent were valid interfaith marriages. If those not sanctioned by the Church were added to these, there would be an even higher per cent of interfaith marriage." The rate is based on marriages reported in the Official Catholic Directory, rather than a cross-section of the population. The interfaith marriage rate is defined as "the per cent which interfaith marriages are of all marriages involving members of a given religious group" (p. 329). See also Loren E. Chancellor and Thomas P. Monahan, "Religious Preference and Inter-Religious Mixtures in Marriages and Divorces in Iowa," *The American Journal of Sociology*, Vol. LXI, No. 3, November 1955.
4. A selected bibliography on studies of fertility differentials among religious groups is presented by Charles F. Westoff in "Religion and Fertility in Metropolitan America," *Thirty Years of Research in Human Fertility: Retrospect and Prospect*, Milbank Memorial Fund, New York, 1959, pp. 117-134. See especially Dudley Kirk, "Recent Trends of Catholic Fertility in the United States," *Current Research in Human Fertility*, Milbank Memorial Fund, New York, 1955, pp. 93-105. Kirk uses official Catholic statistics in examining the trends and current level of Catholic fertility in the United States.
5. See Stanley K. Bigman, *The Jewish Population of Greater Washington in 1956*, The Jewish Community Council of Greater Washington, Washington, 1957, pp. viii-ix. In the Washington area, as in many other areas with relatively large Jewish populations, numerous professional and white collar jobs are available. See also Chapter 23, "Religious Affiliation," in Donald J. Bogue, *The Population of the United States*, The Free Press, New York, 1959.

Book Reviews

GENETIC STUDIES OF GENIUS: VOLUME V, THE GIFTED GROUP AT MID-LIFE. Lewis M. Terman and Melita Oden, Stanford University Press, Berkeley, 1959, 187 pp.

This study of a gifted group at mid-life appears in the year which is celebrating the Centennial of Darwin's "Origin of Species." Both books present a patient accumulation of factual material. Both are destructive of long-held dogmas. "The Origin of Species" finally and irrevocably placed man in his proper relation to all other living things. The times were right for this teaching. But its other great lesson, the variability of living things, was lost to a generation brought up in the struggle for equality of opportunity.

Today Communism preaches that men are cast in an environmental mold, while we in the West still confuse equality of rights with equality of abilities. The fifth volume of Terman's study of gifted children comes most opportunely at this time. Here is an account of 1528 people chosen forty years ago from the schools of the larger California cities solely on the basis of their ability to pass an intelligence test. They were selected from the upper one per cent of the school population. Each had had the same opportunity to learn as the other children in the same schools. Granted that these children had in most cases a superior home environment, Terman believed their home influence alone was not sufficient to account for all of their variation from their fellows; that we are compelled to believe that they were also at an upper level of genetic variability. Terman's belief seems substantiated by their standing at mid-life.

In 1955, the time of the study now reported on, the group were at an average age of 45 years. Deaths had been fewer than have deaths in the general population at similar ages; physical defects are infrequent; a somewhat lower per cent have been admitted to mental hospitals (3.2) than among the general population (3.9) in the same age brackets; the rate of alcoholism is only a fraction of that in the general population. They rate high in "general adjustment."

The first finding then is one of normalcy. Contrary to much opinion, men and women selected in childhood for high test intelligence grow up to be normal people. A larger proportion (90 per cent of the men and 93 per cent of the women) are married by age 44 (p. 133); they marry superior people and their marriages are happier than most; they have at least the average number of children for people in their income class.

Second, they have maintained their intellectual superiority. A specially designed "concept mastery" test, measuring ability at older ages, was given to the gifted group and to various control groups. The gifted had made no change in the relative quality of their abilities.

Thirdly, the study seems to prove that desirable traits go together (p. 143). No negative correlations were found between intelligence and size, strength, physical well-being, or emotional stability. Where correlations occur, they tend to be positive.

Finally, and this of course is the most

important finding of the study, in all aspects of achievement they far outrank their less intelligent fellows. An unusual proportion have entered the professions. Whatever their field of activity, their earnings are substantially above the average, and their avocational interests are broader and more substantial.

The church membership of the gifted is about in the same proportion as that of the general population. At the age of 45 they are a conservative group; but it is interesting to note that within the group those who are highest in intelligence tests tend to be the least conservative (p. 125). Of the men, 55 per cent are Republicans and 33 per cent are Democrats (p. 127). Ninety per cent report that they usually or always vote in state and national elections. By every count the gifted are good citizens.

The first volume published in 1926 tells us something about the homes these children came from and about their parents and families. The present volume, published twenty-nine years later, tells us something of the homes the now grown-up children have established, of their own families and children. The comparisons are interesting.

The parents of the gifted children were for the most part in the upper occupational groupings (p. 63). Based on those for whom reports were available, 29 per cent were in the professional group, as against 2.9 per cent for the total population of Los Angeles and San Francisco from which the sample was drawn. The professional group thus exceeded its quota by over 1,000 per cent. Of the parents, 46 per cent were found in the group of commercial operators as against 36 per cent in the general population; 4.5 per cent were in the public service group, exceeding their quota by one third, and 20 per cent were from the industrial (skilled labor) group, as against a proportion in the general population of 57.7 per cent. The industrial group thus supplied only one-third of its quota. This evidence of a social-occupational hierarchy with respect to the production of superior individuals is in remarkable agreement with a number of other studies on the parentage of people who have achieved eminence. But there is a notable difference; in the other studies the subjects were picked on the basis of their having achieved eminence, in which result the position of their parents might have played an important part. Bu in the case of the Terman study the subjects were picked at the age of ten or eleven years, a fact which, in the language of Terman "strongly suggests that the causal factor lies in original endowment rather than in environmental influences." (p. 66)

While 29.1 per cent of the fathers of the gifted (p. 62) were in the professions, 45.6 per cent of their gifted sons had become professional men by age 45. Seventy-eight of the 758 gifted boys became lawyers or judges as compared to 33 of the parents who were lawyers. Fifty-seven of the gifted men were members of college faculties, as compared to ten of the parents; 32 were teachers or administrators at high schools or junior colleges as compared to 20 of their parents in such positions; 40 were physicians as compared to 23 of the parents.

In the five volumes published so far, the vital statistics are not presented in a way to make possible comparisons between the fertility of the parent group and the fertility of their gifted children. This is particularly regrettable because one would like to know whether, during this thirty-year period, the trend in fertility of the gifted families has followed the fertility patterns of other American

groups. In Volume I, among the parents of the gifted, 91 families are reported as completed (wife 45 or over). Terman introduced three corrections—for selection in the sample, for proportion childless and proportion unmarried—and reduced the "fertility index" of the group from which these parents were drawn to 1.44, a point obviously below the figure needed for replacement. In all but a few of these 91 families data were available on the size of their parents' families. For the families of the fathers (paternal grandparents), the fertility index was 2.59 and for the maternal grandparents the fertility index was 3.26. These limited data would indicate a decline in fertility of 50 per cent in a single generation.

The present generation, the gifted children, while they do not approach the record of their grandparents, have at least done much better than their parents. Volume V records 2,452 children born to the gifted group by 1955, when nearly two-thirds of those married were still under 45. The birth rate was 2.4 per mother, only a little less than the rate of 2.8 which the authors figure was at that time needed for replacement. For what these figures may be worth, they indicate that the gifted of this generation are having more children than did their parents and may almost replace their own number by the time they have finished childbearing. The gifted were born before the depression; they were raising their families in the period 1936 to 1955, which included the last of the depression years, the war, and the period of the baby boom. Terman estimated in Volume I (p. 114) that around 1926 the class of people which included the parents of the gifted were then having 2.18 children per mother. In Volume V we find that the gifted themselves had, by 1955 before the returns were quite all in, produced 2.4 children per mother, a quite substantial increase, especially when one takes into account that a larger proportion were married.

Of the 2,452 offspring of the gifted, 1525 have been given Stanford-Binet tests. The mean score was 132.7 (p. 141), and was exactly the same for the two sexes. The mean score of the gifted parents had been 151. The degree of filial regression is stated to be the same as that predicted by Galton's law (122). Some fifty gifted subjects have adopted children. Of the adopted children, 18 have been tested. Their Binet I.Q.s range from 100 to 146, with six showing I.Q.s of 135 or higher. But the number is small, and no information is given as to how these children were selected for adoption. There are 115 grandchildren so far reported, but these have not been studied.

The members of the gifted group, their children and grandchildren, provide an almost inexhaustible store of material. The present authors state that the data on factors affecting fecundity as found in the rate of reproduction blank is only touched on in this volume (p. 27). It is to be hoped that this material will be made available in future publications and that future studies will be made, particularly on the mate selection, fertility and intelligence of the children and grandchildren of this interesting group.

Few books published in this generation are more deserving of careful study. Melita Oden has made a noteworthy contribution here in carrying on Terman's studies of genius so ably.

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PROTECTION IN DIAGNOSTIC RADIOLOGY: B. P. Sonnenblick (Editor). Rutgers University Press, New Brunswick, New Jersey, 1959. pp. xxx + 346. $7.50.

This is a collection of journal reprints related to the risk of genetic or somatic damage from diagnostic radiology and ways in which this can be reduced. In all, 36 articles by 43 authors are included, along with a general introduction and prefaces to each of the sections by the editor. Together they constitute a thorough and authoritative review, and the book will inevitably lead to decreased radiation exposure, if it is widely read by physicians and dentists, as I hope it will be. For, as Carl Braestrup says in his Foreword, "It is possible today to apply X-rays for diagnostic purposes with a very high degree of safety. . . . The reports in the present volume provide the pertinent information on how a high degree of protection can be achieved without sacrificing the many benefits of ionizing radiation."

In the current excitement over radiation hazards and the public discussion of the effects of radioactive fallout, we need to be reminded that the major sources of radiation in this country are still natural radiations and diagnostic radiology. It is also well to be reminded of the efforts by a small group of radiologists and physicists such as R. R. Newell, Robert Stone, R. H. Chamberlain, R. H. Morgan, H. M. Parker, and C. B. Braestrup who have been working for better radiological protection long before the current interest. Special credit should go to L. S. Taylor for his efforts for many years through the National Committee on Radiation Protection and, of course, to H. J. Muller.

The editor, B. P. Sonnenblick, has done some excellent studies on dosages associated with fluoroscopy and of physicians' awareness of the dosage from their own machines, and some of these are reprinted in the book. His belief is that more will be accomplished by writing and speaking directly to physicians, dentists and radiation technicians than by taking the problem to the general public and, consistent with this view, the book is addressed primarily to these groups.

This is a practical book, for in it are detailed procedures for dose reduction without loss of diagnostic efficiency. There are useful appendices listing protection experts who may be consulted, sources of handbooks, and additional references. The reader will surely be impressed with the low dosages that can be attained when care and good equipment are used, and with the wide difference between good and mediocre practice. Many of the articles deal with detailed aspects of radiation protection and will have limited appeal for the general reader; but several, including especially those on genetic effects by Stern, Muller, Dunn and Russell, and the introductory comments by the editor, will be of special interest to readers of this journal.

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THE STUDY OF POPULATION—AN INTORY AND APPRAISAL: Philip M. Hauser and Otis Dudley Duncan (Editors). University of Chicago Press, Chicago, 1959, 864 pp., $15.00.

The National Science Foundation some years ago commissioned this formidable assessment of the status of demography as a science. Major responsibility for the study was delegated to the Uni-

versity of Chicago's Population Research and Training Center, where two senior staff members—Philip M. Hauser and Otis Dudley Duncan—undertook the planning and editing. The study was actually initiated late in 1954.

However, Hauser and Duncan, more than merely editing, created the framework which made this study both possible and practicable. Contributions from prominent scholars, both here and abroad, were solicited and each was asked, within the limits of their own predilections, to adhere as closely as possible to this framework. The final result emerges as a massive tome, with 27 chapters by these contributors and six by the editors. Quite naturally, a symposium of this type is of uneven quality, and it is also one in which not all contributors had always the same objectives and framework in mind. Nevertheless this book on the whole does answer its major purposes and in so doing makes an outstanding contribution to the discipline of demography.

The volume consists of a general summary, entitled "Overview and Conclusions," and four major parts. The general summary and Part I, "Demography as a Science," were written in their entirety by the editors. These sections cover the definition of demography, its data and methods, demography as a body of knowledge (essentially an excellent discussion of population theory), and as a profession. In addition they discuss whether demography can be considered as a science at all. This latter question is answered in the affirmative because demography "embodies all the essential elements of scientific outlook and method." These sections also contain a summary of the articles by the contributors and make an attempt to reconcile their concepts with those of the editors.

Part II, "Development and Current Status of Demography," after an introduction by the editors, begins with an historical review by Frank Lorimer of the development of demography. This brilliant essay illuminates some of the major theoretical and philosophical themes in the early unfolding of this discipline and traces their evolution and subsequent convergence. It is followed by eight contributions on both the development and current status of demography in selected countries or areas. The areas (and authors) are: France (Sauvy), Great Britain (Grebenik), India (Chandrasekaran), the Pacific Area (Irene B. Taeuber), the United States (Vance), Germany (Schubnell), Italy (Costanzo), and Brazil (Mortara). Each article is a comprehensive treatment of its subject and very valuable in its own right, quite apart from its merit as a part of this symposium.

Part III, "The Elements of Demography," presents definitive treatments of the major substantive areas on which demographic research is currently focused. This section begins with a valuable comparative survey (Linder) of "World Demographic Data." It continues with papers on population composition (Hawley), distribution (Bogue), growth and replacement (Hyrenius), and estimates and projections (Grauman); on fertility (Ryder), mortality (Dorn), internal migration (Bogue), international migration (Brinley Thomas), family statistics (Glick), working force (Jaffe), and natural resources (Ackerman).

Finally, Part IV, "Population Studies in Various Disciplines," treats the relationships of demography to those disciplines with which it is most closely linked: ecology (Frank), human ecology

(Duncan), geography (Ackerman), physical anthropology (Spuhler), genetics (Kallmann and Rainer), economics (Spengler), and sociology (Moore).

In view of a pre-publication assault on this book, this reviewer was all the more surprised to find a solid, competent, and scholarly work, one that is sure to be considered a standard reference text in its area for many years to come. It ploughs fields where few have ventured to tread, and thus it forces us to re-examine our efforts to create a *science* of demography. Obviously, as the book points out, we have a long way to go, perhaps furthest in the domain of creating a body of population "theory," a crucial prerequisite for a science.

As with all symposia, the selections are uneven in quality. This reviewer found most stimulating the articles by Lorimer, Dorn, Taeuber, Vance, Moore, and Jaffe, as well as those by the editors themselves. The article by Ryder might have been classed among these had it been couched in somewhat clearer language. Kallmann and Rainer's article on "Genetics and Demography," provides a clear up-to-date review of research in this field, with special emphasis on genetic aspects of public health (eugenics) and the effects of atomic and nuclear radiation. Moore's article represents an attempt at integration of demographic "theory," i.e., Malthusian tenets and the "demographic transition," with sociological "functionalism" and current theories of social change.

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THE MATERIALS OF DEMOGRAPHY. A SELECTED AND ANNOTATED BIBLIOGRAPHY: Hope Eldridge. Foreword by Dudley Kirk. Published by International Union for the Scientific Study of Population and Population Association of America, 1959. xi, 222 pp. In the United States, from: Professor Kurt Mayer, Secretary, Population Association of America, Brown University, Providence, R. I. Elsewhere, from: M. M. Croze, Administrative Director, International Union for the Scientific Study of Population, 29, Quai Branly, Paris, 7e, France.

Demography developed as a statistical and research science, with its personnel largely in government offices and research institutions. Teaching long remained a lecture or two on Malthusian or Keynsian theory in economics, a problems course in sociology. There were major barriers to the development of instruction at undergraduate or graduate levels, for secondary or professional concentration, in the United States or elsewhere. There is a core of method and content that is specifically demographic, but the science itself is interdisciplinary, and the disciplines involved extend from biology to anthropology. Then, too, research in the interrelations of populations with locale, resources, economy, society, and politics requires manifold combinations of capabilities, and it scatters activities and publications in many institutions and many journals. The types of interrelations among demographic and other variables are also reflected in geographic, economic, and cultural localizations in population status, changes, and prospects.

There may be texts and monographs in the limited core of demography, but no book or books can meet the manifold needs of all those whose areas or topics involve demographic knowledge and research. It was against this background

that the International Union for the Scientific Study of Population appointed a Committee on Demographic Instruction. An initial publication on the teaching of demography was issued by UNESCO in 1957. This study of *The Materials of Demography* is the first of a series of annotated bibliographies of the literature in various of the major languages.

The Committee on Demographic Instruction commissioned Dr. Hope T. Eldridge to compile and annotate a bibliography of demographic literature for teachers, students, and research workers. Dr. Eldridge was given "freedom to define the scope of demography . . . and to select the titles for inclusion in it." The task implicit in this mandate can be appreciated by one who struggled for some two decades with the widely scattered and highly varied output of a field whose boundaries are amorphous at given times and change over time.

Dr. Eldridge limited herself to the central core of demography, the study of population change in terms of its components, including their variations among areas and population sub-groups and their biological and social correlates and results. The objective was the identification of significant works in population analysis, particularly for the use of teachers of demography. In the selection of materials for inclusion, the ideal was "a balanced representation with respect to availability of materials, place of publication, points of view expressed, and levels of technical difficulty." Titles of works of particular importance are indicated with an asterisk.

The result of a rational definition, a feasible plan, rigid selection from the literature, and systematic cross-reference presentation is a seemingly simple and highly usable compendium. Its usefulness will extend beyond the teachers of demography to non-teaching demographers and prospective demographers, and to teachers and students in related fields. Institutions and libraries will use it in building or completing collections of demographic materials.

The scope of the materials cites may be indicated by listing the major sections: I. General works in demography. II. Population problems and theories. III. General demographic studies of specific populations. IV. Problems and methods of demographic analysis. V. Studies of fertility, marriage, and reproduction. VI. Studies of mortality and morbidity. VIII. Studies of manpower and labor force. IX. Studies and reports of legislative measures, administrative programs, and policies affecting population. X. Statistical compendia and bibliographies. Introductory notes, cross references, and summaries of titles facilitate use.

The Materials of Demography emphasizes the publications of recent years, and systematic coverage ends with the year 1957. The value of the work argues both for extension and for currency. Extension could be achieved by analysis of the developments in specific fields, with evaluative bibliographies. Currency could be achieved by occasional addenda that would be at the same time selections and evaluations from the comprehensive coverage of *Population Index*.

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NOTES ON RECENT PUBLICATIONS

CLASSIC PAPERS IN GENETICS: James A. Peters (Editor). Prentice-Hall, Englewood Cliffs, New Jersey, 1959, 282 pp.

A collection of papers demonstrating the impressive march of genetic research commencing with Mendel's original paper on the gene, whose results "were almost miraculously close to perfect." Sutton's paper on the chromosome marks the beginning of cytogenetics, and T. H. Morgan's describes a striking variant breeding true in successive generations and opens up the possibility of assigning a specific gene locus to a specific chromosome. Sewall Wright's discussion of color inheritance in mammals shifts emphasis to the ways the gene goes about doing what it does rather than on the mechanism of its transmission. Muller's paper on artificial transmutation of the gene is included as a major turning point in the study of heredity. Avery *et al.* as far back as 1944 show DNA to be a primary hereditary material. Beadle and Tatum describe genetic control of biochemical reactions as early as 1941. The Watson-Crick model of the molecular structure of DNA is contained in a 1953 paper. The final paper by Beyer is on the structure of a genetic region in bacteriophage. Genetics is on the verge of a major break-through, if it hasn't already completed it, surmises the editor of these "classics" which cover fifty odd years of research.

THE MOLECULAR BASIS OF EVOLUTION: Christian B. Anfinsen, John Wiley, New York, 1959, 228 pp.

Possibilities of integrating studies in protein chemistry and genetics for better understanding of evolution are explored here. The volume outlines fundamentals of evolution and presents material on genetics and basic facts of protein structure. A few aspects of natural selection in evolution are included as well as some experimental approaches at the molecular level.

THE GENETICAL THEORY OF NATURAL SELECTION: R. A. Fisher (2nd revised edition). Dover Publications, New York, 1958, 291 pp.

A revised paperback edition of a book first issued in 1929 which considers the theory of natural selection separately on its own merits. The author points out that no efforts of his could make the work easy reading, but short summaries at the end of the chapters assist the reader.

INVOLUTIONAL MELANCHOLIA—An Etiologic, Clinical, and Social Study of Endogenous Depression in Later Life with Special Reference to Genetic Factors: Ake Stenstedt, M.D. Munksgaard, Copenhagen, 1959, 71 pp.

A study of 307 probands with involutional melancholia and their sibs and parents: in all, 2,282 persons, a much greater number than in any previous material, according to the author. Concerned mainly with causes, especially genetic, of involutional melancholia but covers some material on social and clinical aspects.

FIRST-COUSIN MARRIAGES IN SWEDEN, AND A STUDY OF THE POPULATION MOVEMENT IN SOME SWEDISH SUBPOPULATIONS FROM THE GENETIC-STATISTICAL VIEWPOINT—A Preliminary Report: Carl H. Alström. Acta Genetica et Statistica Medica, Separatum Vol. 8, No. 3/4, S. Karger, Basel, 1958, 369 pp.

A preliminary report of an investigation started in 1956, which complements a more extensive investigation of schizophrenic and manic-depressive disorders in a Swedish county. The population-genetic background was investigated through the use of parish registers. Despite a great increase in intermigration, subpopulations in different districts of Sweden in recent times have about the same first-cousin marriage rates as those

found through this investigation to exist in the same regions more than 100 years ago.

A Clinical and Genetico-Statistical Study of Schizophrenia and Low-Grade Mental Deficiency in a Large Swedish Rural Population: Bertil Hallgren and Torsten Sjögren. Acta Psychiatrica et Neurologica Scandinavica, Supplementum 140, Vol. 35, Munksgaard, Copenhagen, 1959, 65 pp.

Investigation of a rural area of about 25,000 inhabitants. Deals with results relating to morbidity rates among parents and sibs of the schizophrenic and mentally deficient studied. The genetic analysis of the material confirms conclusions of previous investigations that specific genetic factors are important in schizophrenia. In the material as a whole the actual morbidity rate for schizophrenia among the sibs was significantly higher than the risk. Specific genetic factors were also found to be important in low-grade mental deficiency.

Les Methodes en Genetique Generale et en Genetique Humaine: Roger Huron and Jacques Ruffié. Masson et Cie, Paris, 1959, 556 pp.

The first part of this volume deals with general genetics from Mendel to today. The second describes methods of studying heredity, and the third section covers at length mathematical methods and their applications. Eugenic considerations are discussed in the conclusion. The text is highly mathematical for the most part.

Maladies Hereditaires Du Metabolisme chez L'Enfant: Maurice Lamy, Pierre Royer, Jean Frézal. Masson et Cie, Paris, 1959, 556 pp.

Hereditary illnesses of metabolism are described here both clinically and genetically. The authors have striven to make their material understandable to the non-specialist.

Multilingual Demographic Dictionary: Population Studies, No. 29. United Nations, Department of Economic and Social Affairs, New York, 1958, 77 pages.

This dictionary is intended as a useful tool for technical translators. Separate sections, topically arranged, define technical terms in demography. The terms are explained in paragraph form rather than listings. An alphabetical index of terms is included. The text is published in English, French, and Spanish editions, but they correspond to each other. This is the English edition.

Premarital Dating Behavior: Winston Ehrmann. Henry Holt, New York, 1959, 316 pp.

Female sex expression is primarily and profoundly related to being in love and going steady. This is probably the single most important empirical finding, says the author of this study of the premarital sexual activities in dating as reported by a thousand male and female college students. Pleasure among our females is primarily associated with love and among our males with sex. Findings here strongly indicate that the difference between young men and women in regard to sex and love is so marked that there are distinct male and female subcultures.

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Periodical Reviews

GENETICS

Evidence for the existence of the human "super female." P. A. Jacobs, A. G. Baikie, W. M. C. Brown, T. N. MacGregor, N. MacLean, and D. G. Harnden. *Lancet,* 7100 (1959), pp. 423-425.

It is now known that the sex chromosome complement of chromatin positive individuals with Klinefelter's syndrome is XXY, while that of chromatin negative individuals with Turner's syndrome is XO. The explanation is one of nondisjunction during either the formation of a sperm cell by the father or an egg cell by the mother.

If a female produces an egg with two X chromosomes, and this egg is fertilized by a Y-bearing sperm cell, an XXY zygote results and the individual becomes a Klinefelter. Since such an egg should have about an equal chance of being fertilized by an X-bearing sperm, XXX zygotes should occur in addition to XXY zygotes. In *Drosophila melanogaster,* XXX flies are known as superfemales. The name is perhaps a misnomer since these types are poorly viable and sterile.

Although it might be conjectured from experience with Drosophila, that XXX human zygotes, due to inviability, would have a low probability of surviving and therefore would probably not be encountered, the authors discovered a single case, showing that human "super females" do survive.

The individual was born in 1924, the youngest of a sibship of three girls. Menstruation began at age 14 but was irregular and stopped five years later. She was of average height and weight but exhibited underdeveloped breasts, small vagina, and infantile genitalia. The chromosome number was 47 with three X chromosomes being present.

Barr chromatin bodies appeared in 71 per cent of her buccal mucosal cells, and 14 per cent of these cells contained two of these chromatin bodies. In normal XX females, only about 41 per cent of the buccal mucosal cells show a Barr chromatin body and only rarely, if ever, do two occur in a single cell. The authors suggest that this difference may be useful in screening individuals for this sexual anomaly.

Tests for phenylketonuria—results of a one-year programme for its detection in infancy and among mental defectives. N. K. Gibbs and L. I. Woolf. *Brit. Med. J.,* 5151 (1959), pp. 532-535.

It is now well established that with few exceptions, individuals with the genetic disease phenylketonuria who are treated with a low phenylalanine diet from the age of one or a few weeks, develop normally, while untreated individuals remain mentally deficient with modal IQ of about 10. For this reason the authors stress the importance of detecting phenylketonurics at an early age.

The standard procedure for doing this is to add a few drops of 5 per cent ferric chloride to a sample of urine and to note the characteristic change to a green color which is indicative of phenylpyruvic acid in the urine. The authors suggest a more simple and equally satisfactory method. This is by using "Phenistix," a strip of paper which is dipped into the urine like litmus paper.

The authors ran a survey on the births in Cardiff, Wales, over a one-year period. The mothers were asked to supply a specimen of the babies' urine at age three weeks. Although 4,530 births occurred during this period, only 1,192 specimens were obtained for testing. The mothers of the remaining babies (73.7 per cent) stated that they were not able to obtain the specimen of urine from the child. Fifty-one specimens were discarded for being strongly alkaline. From the remaining 1,141 specimens, one was shown to be positive for phenylpyruvic acid and the baby was later confirmed as a phenylketonuric by a serum phenylalanine test. The infant was treated successfully.

The authors stress that a urine test carried out at three weeks will not pick up all cases of phenylketonuria since the first appearance of phenylpyruvic acid in the urine in these individuals varies from six days to six weeks. This presents a problem, since mental development will only be normal if treatment is begun early. At three weeks, the great majority of phenylketonurics will be detected, but if treatment is begun at this time, slight mental deterioration will still occur in many cases. The best procedure for population surveys, in order to have complete detection early enough for successful treatment, would be repeated testing from seven days to two months. However, as the Cardiff study showed, there would be technical problems of cooperation involved in such studies.

Chromosomal sex in the syndrome of testicular feminisation. P. A. Jacobs, A. G. Baikie, W. M. C. Brown, H. Forrest, J. R. Roy, J. S. S. Stewart, and B. Lennox. *Lancet,* 7103 (1959), pp. 591-592.

Individuals with testicular feminization syndromes are negative for the Barr chromatin body. Phenotypically, they are females, with female external genitalia and normally developed breasts. However, they are characterized by scanty or absent pubic and axillary hair, primary amenorrhea, incompletely developed vagina, presence or absence or rudimentary uterus and Fallopian tubes, the occurrence of testes in the abdomen or inguinal canals, and the occasional presence of an epididymis and vas deferens on both sides.

The authors demonstrated that the normal chromosome number of 46 is present, but the sex chromosome complement is XY, or typically male. Individuals with this type of syndrome are now considered as sex-reversed males.

Sex reversal has been studied in *Drosophilia melanogaster.* The autosomal recessive gene *tra* on the third chromosome, when homozygous, transforms diploid females into sterile males. Since individuals with testicular feminization syndrome will often have similarly affected sibs, it appears that genetic sex-reversal phenomenon is involved, only in the opposite direction than in *Drosophila.* The distribution of cases in families suggets that the gene involved is recessive and located on the X chromosome; however, the data are also compatible with the action of a dominant autosomal gene that is sex limited.

Haemophila in a "girl" with male sex-chromatin pattern. I. M. Nilsson, S. Gergman, J. Reitalu, and J. Waldenström. *Lancet,* 7097 (1959), pp. 264-266.

Classical hemophilia (antihemophilia globulin deficiency) is due to a recessive gene on the X chromosome. In most pedigrees where this trait occurs, affected males receive the gene from their mothers, and females can only be affected by receiving one of these genes from their affected fathers and one from their mothers. For this reason, the trait is very rare in females.

The authors present an interesting pedigree with four affected males and one affected female (age 16 months). The mother of the affected girl was clearly a carrier of the sex-linked recessive gene since she had produced an affected son. However, importantly, the father of the affected girl was normal. This case is seemingly an exception to the rule; however, the authors show that in reality, the case conforms to the expected genetic pattern.

The girl was shown to be negative for the Barr chromatin body, indicating the presence of a single X chromosome. The chromosome number was 46 and the sex chromosome complement was XY.

The evidence is clear, then, that this girl is a sex-reversed male, and received her X chromosome bearing the recessive gene for hemophilia from her mother and her Y chromosome from her father. The authors suggest that other exceptions to sex-linked inheritance reported in the literature may have a similar explanation.

Genetic factors influencing isoniazid blood levels in humans. R. A. Knight, M. J. Selin and H. W. Harris. *Trans. 18th Conf. on the Chemotherapy of Tuberculosis,* VA-Armed Forces, 18 (1959), pp. 52-58.

Of extreme interest to investigators in the field of human genetics is the discovery of simple Mendelian traits that occur at a relatively high frequency in the general population, similar to certain blood groups and the ability to taste PTC. In addition to being useful for population and anthropological studies, they serve a useful purpose as markers in linkage studies. The authors present data suggesting that another such marker may have been found. By a bioassay method, they determined the serum levels of isoniazid six hours after a four mg/Kg oral dose. This compound is commonly given to tuberculosis patients for therapeutic reasons. Individuals with a six-hour serum isoniazid concentration below 0.4 mcg/ml are called rapid inactivators while those with a concentration above this level are called slow inactivators.

It was noted that individuals of Japanese ancestry are more often rapid inactivators than individuals of Northern European ancestry. The authors present four small pedigrees and the results of a pilot statistical study of 20 families, showing that simple Mendelian inheritance may be involved where rapid is dominant to slow.

The difficulty with the proposed form of inheritance is the occasional occurrence of intermediate inactivators who show a six-hour serum ironiazid concentration of 0.4 mcg/ml and the observation that there is variation among rapid and slow inactivators. Even though a sample of individuals may show a distinct bimodal distribution, this demonstrates that isoniazid inactivation is still largely quantitative in nature, and by

the technique used, all individuals cannot be clearly classified as rapid or slow. The frequency of intermediates indicates that they are not heterozygotes.

Before markers of this type will be useful for population surveys, a more accurate and less time-consuming laboratory technique of classification is needed. More investigations are needed on this interesting and important finding, as well as on the inactivation of related and unrelated compounds.

Maternal influence and congenital deformities—a prospective study. V. P. Coffey and W. J. E. Jessop. *Lancet,* 7109 (1959), pp. 935-938.

Information on the etiological factors concerned with congenital malformations, whether genetic, non-genetic, or a combination of both, is obviously of vital importance for genetic counseling reasons.

In order to determine the role of influenza during pregnancy, the authors studied pregnant women attending an antenatal clinic in Dublin during the 1957-58 Asian influenza epidemic. A total of 663 of these women stated that they had influenza during their pregnancy. The percentage of malformed babies born to this group was 3.6 as compared with 1.5 per cent born to a control group. The difference is statistically significant at the 0.05 level of probability. The malformations were almost entirely of the central nervous system. The commonest type was anencephaly. The risk of malformation appeared to be greatest if the infection occurred during the first three months of pregnancy.

Handedness: a family study. A. Falek, *The American Journal of Human Genetics,* 11 (1959), pp. 52-62.

The author reports the results of a hand preference study carried out on New York City school children and their parents. A questionnaire was circulated that was designed, by the answers given, to classify the individuals as right or left-handed. From a total of 10,900 questionnaires distributed, 5,652 were returned and 5,118 were acceptable for the study. The parents were divided into four groups: (1) both right-handed; (2) both left-handed; (3) father right, mother left; and (4) father left, mother right. A sample of each group was then taken at random, except for the both left-handed group, which was used *in toto* because of its small size, and homes were visited. The parents were interviewed, and all family members over five years of age were given further hand preference tests.

The author concludes from his data that hand preference of an individual is the result of both his genetic endowment and his early training at home. Left-handed fathers are particularly cognizant of the economic and social drawbacks of left-handedness and tend to be most concerned with making their children right-handed. Left-handed wives of right-handed men appear to be less concerned about the matter, and right-handed parents are the least conscious of the problem associated with left-handedness.

Although the nature of the genetic component is complex and not known, its importance is illustrated by the familial nature of the left-handedness trait and the observation that some left-handed parents are unable to change the hand preference of their children.

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POPULATION

Induced abortions in Japan in 1953-1954. Masabumi Kimura. *Milbank Memorial Fund Quarterly* **37**, 2 (April 1959), 154-173.

Questionnaires mailed to each of the 9,600 physicians in Japan authorized under the Eugenic Protection Law of 1948 to perform abortions furnished usable information on 6,174 induced abortions carried out between late 1953 and mid-1954. Although these cases constitute a small and not unbiased sample of the 900,000 induced abortions reported to the appropriate government agency during the period and of the unknown total number of abortions actually performed, the data are more detailed than those available in the official registration and, the author believes, probably more representative.

Abortions terminated relatively few pregnancies of high order in the sample: most of the women had been married less than ten years and had three or fewer children. Average age at first abortion was 31.4 years. Mean order of pregnancy for first abortions was 3.8. Third and higher order abortions usually (75 per cent of the cases) involved women with records of continuous terminations of pregnancies by abortion.

A comparison of the abortions of the sample with earlier abortions reported by the same women showed that the average number of children living at the time of the earlier abortions was greater at each order of abortion than for the more recent data. The author suggests wider use of contraception as an explanation.

According to the classification rules used in this study, the abortions were desired for reasons of health in 15 to 20 per cent of the cases, for economic reasons in 15 per cent of the cases, and to achieve child spacing in 15 per cent of the cases. "A combination of the various reasons that said essentially that another child was not wanted accounted for about half the reasons given by the women having abortions in the 1953-1954 survey" (p. 173).

The fertility of two-generation urbanites. David Goldberg. *Population Studies* **12**, 3 (March 1959), 214-222.

To investigate the hypothesis that the inverse relationship between fertility and socio-economic status results from differing proportions of farm migrants in the several urban status categories, the author examined data from six Detroit Area Study samples of 1952-1958. Married couples with husband present and wife age 40 or older were eligible for the analysis. Two-generation urbanites—defined as couples for whom the husband's father was reported to have an urban occupation—were compared with migrants from farms.

When the two-generation urbanites were examined separately, the fertility differentials among occupational groups and those among income groups proved to be much narrower and the inverse pattern much less clear than for the whole urban population. The farm migrants, on the other hand, showed the inverse relationship strongly. The significance of the migrants for the whole urban fertility pattern was intensified by the fact that the migrants were more heavily represented in the lower than in the upper economic categories.

Fertility differentials by religion were considerably smaller for the two-gener-

ation urban population than for the general population. Education of wife, in contrast to the other characteristics examined, retained its inverse relationship with fertility even in the two-generation group.

To explain the small differences in the fertility of the economic groups among the two-generation urbanites, the author suggests the possibility that higher status is directly related to fertility desires of men are inversely related for women. Hence as status rises the influences of the husband and wife on family-size decisions may cancel each other.

Population planning and quality of life. Sir Julian Huxley. *Eugenics Review* 51, 3 (October 1959), 149-154.

To the questions "What are people for? What is the aim of human life?" the author replies, "It cannot be merely increase in quantity. . . . It surely must be increased quality of life, and its progressive enrichment" (p. 150). Some thirteen threats to human fulfillment that arise from excessive population increase are enumerated: undernourishment; deforestation and erosion; inadequate water supply; increased numbers of illiterates; destruction of cultural variety; restricted human liberty, resulting from the degree of organization necessary if efficiency is to be maintained; growth of cities to sizes far beyond the optimum for efficiency and for human living; in technologically advanced countries, heavy pressure on space; export of suffering and discontent from crowded countries to those receiving immigrants; reduced possibilities of satisfying employment; in underdeveloped, densely populated countries, reduced possibility of saving enough capital to achieve a higher standard of living; curtailed possibilities of wonder, enjoyment, and adventure; frustration of human need to feel in some harmonious relation with nature.

To attack the population problem, the author suggests that government ministries of health should be enlarged into ministries of health and population with equal importance given to each of the two branches. Economic motivation for population control should be provided by systems of family allowances in which the amount allowed decreases sharply after the second child. Supporting modifications of the tax structure might also be introduced. Individuals should be encouraged to aspire to higher standards of living and to realize the advantages of family limitation both for the family itself and for the nation.

India is offered as an example of a particularly pressing population situation. The allocation of $14,000,000 in one year to malaria control, which will increase population, and of only $10,000,000 for all measures which would reduce population is characterized as "an economic absurdity."

Pression démographique et questions connexes. Roland Pressat. *Familles dans le monde* 12, 2 (June 1959), 79-84.

Noting that "population pressure" is a vague and relative term, the author suggests that "overpopulation" is more useful for describing the inability of an area to support its inhabitants. However, the fact that some of the most densely populated areas have very satisfactory production per person shows that the planet is far from demographic saturation. In the developed countries it is rarely the case that further growth would result in lower levels of living.

It is with respect to underdeveloped countries that one may speak more freely of overpopulation. Their rate of growth—a result of health improvements introduced from the outside—does raise the possibility of global overpopulation and already implies heavy burdens of dependency. A purely demographic solution to this problem, Pressat believes, is illusory. Inadequacies of contraceptive methods and the lack of sufficient individual motivation for voluntary limitations of births make it clear that an economic solution must come first. The rate of population growth will then adjust to the state of economic development.

Interstellar migration and the population problem. Gilbert Hardin. *Journal of Heredity* 50, 2 (March-April 1959), 68-70.

Although extra-terrestrial migration is not seriously proposed by demographers as a solution to the world's population problem, its future possibility is sometimes suggested in popular discussions. This article examines briefly the economic and social implications of such migration on a large scale.

If, as the author assumes, the other planets of our solar system are unsuitable as abodes for man, the destination of emigrants would have to be to the nearest star, 4.3 light years away. To reach there at the fastest speeds attained by present rockets would require 129,000 years. The most optimistic assumptions that now seem at all plausible might reduce the time to 350 years. A space ship appropriate for such a trip might cost $3,000,000 per passenger to build. This implies that Americans "by cutting our standard of living down to 18 per cent of its present level, could in *one year's time* set aside enough capital to finance the exportation of *one day's increase* in the population of the entire world" (p. 69).

In the social portion of his analysis, the author suggests that individuals undertaking the inter-stellar journey would have to be willing to live for about 350 years in an unchanging social system, and, in particular, would have to limit births to a number that would no more than replace those dying. Persons willing to limit births would be selected for emigration, while those unwilling would remain behind. The result would be an intensification of the population problem on the earth and the eventual appearance of the Malthusian checks to population growth.

Although the article is highly speculative and is more polemic than scientific in tone, it furnishes an interesting sidelight on present discussions of population growth.

World birth control challenge. Robert Coughlan. *Life* 47, 21 (November 22, 1959), 159-176.

Population: the numbers game. [Robert C. Christopher.] *Time* 75, 2 (January 11, 1960), 19-22.

The magnitude of the problem of world population growth and possible approaches to its solution are at last being put before the general public of the United States in some detail. A documentary presentation by the Columbia Broadcasting System Television Network late in 1959, repeated in an expanded form in January 1960, dealt particularly with the case of India and included discussion by prominent clergymen as well as scientists and political leaders. Statements by various individuals considered

potential candidates for the presidency —for all the ineptitude or evasion of many of the remarks—serve at least to draw attention to a critical situation.

An excellent contribution to the informing of the public is the *Life* article under review. After a summary of the evidence that improved mortality conditions now make birth control an "inescapable necessity," the author considers two issues: whether a satisfactory method will be available in time; and whether religious and social customs will permit its acceptance. "All in all," he concludes, "the chances seem to favor a positive answer to both questions" (p. 176). This leaves the question of how to focus science, public policy, and individual behavior on the solution of the population problem. The author implies that the preservation of Western beliefs, including those of Christianity, will be rendered more likely if American foreign aid programs include assistance in the area of population control.

Though the difficulties that result from the stand taken by the Roman Catholic church are perhaps understated, the article is informative in many respects, particularly as to present research in fertility control.

An article in *Life*'s sister journal, *Time*, a few weeks later furnishes some additional anecdotal perspective on the population situation and balances the rather optimistic tone of the *Life* presentation with an indication of some of the difficulties facing attempts to solve the problem. That the article is a first-quality product of "a journalistic process unique in its functioning and unrivalled in its ability to cut to the heart of great issues," as is suggested by its publisher (p. 9), may be questioned. Many demographers would disagree with the statement (p. 21) that "In nations with a high technology, there is literal truth in Ben Franklin's dictum: 'We can never have too many People.'" Nor would there be universal assent among specialists in the field to the assertion (p. 22) that "The fundamental difference of opinion over the population explosion is between those who have confidence in man's ability to go on mastering his environment and those who do not." For many, the important difference would seem to lie between those who believe that continued mastery will require explicit attention to the population problem and those who believe that its solution will follow from developments in other economic and social fields.

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Smith College

The Second International Conference of

HUMAN GENETICS

September 7-12, 1961 — Rome

The Second International Conference of Human Genetics is to be held in Rome on September 7-12, 1961, in the Conference Building of the Food and Agriculture Organization of the United Nations.

The decision to hold a second conference was made by the membership of the First International Congress of Human Genetics held in Copenhagen in 1956. A standing committee was elected at that time to arrange for the date and place of this conference. Professor Tage Kemp (Copenhagen) was designated chairman of this committee, and Professors A. Franceschetti (Geneva), F. J. Kallmann (New York) and L. S. Penrose (London) were the committee members.

The organization of the conference will closely follow the successful pattern established by Professor Kemp and his group at Copenhagen. In addition to an Italian organizing committee, national committees will be reestablished to promote the widest possible interest and active cooperation on the part of human, anthropological, medical and clinical geneticists and eugenists. A quarterly bulletin will be published and distributed among all interested groups. The organizing committee would appreciate suggestions to be printed in this bulletin, as well as the names and addresses of individuals, journals, or societies interested in receiving it.

An arrangement will be made with the Excerpta Medica Foundation to print abstracts of the papers to be read at the conference.

The Excerpta Medica Foundation, Amsterdam and New York, has agreed to publish in July 1961 a special issue devoted entirely to the Second International Conference of Human Genetics, Rome, September 7-12, 1961, containing the abstracts of all papers to be presented.

Those wishing to present a paper at this congress are kindly requested to contact Professor Luigi Gedda, Istituto, Gregorio Mendel, 5, Piazza Galeno, Rome-Italy.

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